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ABSTRACT

The learning activities in this handbook were taken directly from Tucson Early Education Model (TEEM) classrooms and designed to foster intellectual and language development. More specifically, these activities are designed to foster linguistic awareness, sensory perception, curiosity, and imagination, to guide the child in differentiating fantasy from reality, to foster the creative process, the habit of labeling, identification and discrimination, classification skills, spatial relations, time understanding, and the concepts of quantity and change. The concept of change includes spatial, temporal, textural, developmental, cyclic, atmospheric, mechanical and chemical changes. In addition, the activities are designed to produce awareness of cause and effect, to foster the practice of tentativeness, to teach how to make choices, to develop the ability to be relevant, to teach planning and to facilitate problem solving (social and intellectual). (MS)

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INTELLECTUAL SKILLS

AND LANGUAGE

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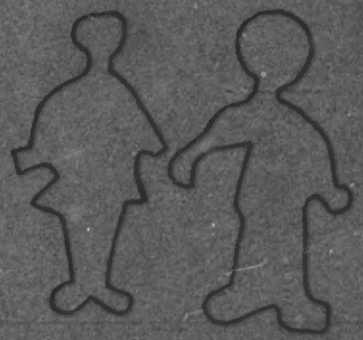

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FOREWORD

Consistent with the educational philosophy of open-endedness which underlies all Tucson Early Education Model (TEEM) efforts, the authors of this handbook have left a great deal to you, the classroom teachers, to complete. This represents a stimulating prod to pursue your own formulation of your own theoretical base for strengthening intellectual skills, for recognizing language facilitation, and for orchestrating the total classroom activity so that the language-thought focus of the handbook is not separated out from the total learning process.

It is hoped you will generate some activities, extend your knowledge of various skills, inventory the intrinsic language more completely, and provide whatever glue will make it possible to relate the various learning to learn areas. By sharing these discoveries each of you should begin to produce your own personal handbook for your own continued use.

Activities and interaction samples are taken directly from TEEM classrooms (k-3) and reflect some of the maturity that surprises new observers of TEEM. That very maturity indicates the TEEM teacher's awareness of always asking, "What next?" for the child.

ACKNOWLEDGMENTS

Appreciation is expressed for the generous sharing of efforts of the many teachers in the Tucson Early Education Model (TEEM) program in nineteen scattered communities in the country. This handbook indicates something of the vast range and complexity of concerns that TEEM teachers undertake to consider. Acting on the counsel of Mrs. Halene Weaver, one of the earlier program assistants in the project, the authors have avoided the textbook approach with its usual didactic instructions. We have, instead, attempted to open the doors to important areas which the teacher should explore in her classroom, hopefully with the assistance of some scholarly reading.

The authors are grateful to Dr. Courtney Cazden of Harvard University, Dr. Bernard Spodek of the University of Illinois, and Dr. Carol Rubow Foster of Georgia State University for critical analyses and careful evaluations of the value and the limitations of these materials, thus helping us to state ourselves more clearly for a defined audience.

Mrs. Joan Darnell, a teacher in Follow Through at Ochoa Elementary School, Tucson, Arizona, graciously agreed to respond to these materials with respect to their usefulness as a curriculum source. Thus we were able to make some revisions and to gauge the possibility of the handbook's capability to generate teacher involvement in language/intellectual activities to stimulate language/intellectual growth.

Dr. Joseph M. Fillerup, TEEM Follow Through Director, and Mrs. Alice S. Paul, Coordinator of Educational Development, merit appreciation for encouragement for the development of the handbook and for motivating us to persist to production.

Arline B. Hobson
Perry B. McCauley

INTRODUCTION

This bulletin is essentially a sequel to and philosophically dependent upon *The Natural Method of Language Learning: Systematized.*[1] It is an elaboration of Chapter II of this monograph with primary emphasis on the teacher as a model of the language intrinsic to given learning to learn skills. This is only a part of the exercise and the discipline of putting the natural method into effect.

It would be a mistake to ignore all the environmental ordering necessary to elicit intellectual skills. In fact it was stated in *The Natural Method of Language Learning: Systematized:*

> "The teacher is obligated to structure and to constrain a situation that will stimulate the practice of a specific skill with its intrinsic language; thus it is her responsibility to structure the environment so that there is a situational demand for specific modes of thought and to be prepared to model the particular language forms related to such thought."[2]

The basis for this bulletin stems directly from two major beliefs within the TEEM project:

1. Cognitive growth and language development are interacting processes, each stimulating the other and resulting from the other.
2. Language, with its phonological, syntactical, and semantic systems, is learned by:
   a. getting meaning from a situation;
   b. interacting verbally with an adult who models more and more complex language patterns for the child.

Nineteen areas of intellectual skills that are basic to a child's development as a selfstarting learner have been identified and discussed. Under each category the teacher is offered a few suggestions for helping the child. Some activities that would evoke the given skills are listed. A beginning inventory of language patterns intrinsic to the skill is presented with an identification at a more technical level of the linguistic label.

Clearly implied in the sections on Classroom Activities is the importance of environmental structuring. While arranging the environment, it behooves the teacher to anticipate and to prepare an inventory of the intrinsic language with respect to forms, lexicon (vocabulary), idioms, figurative language, concrete to abstract variations, and in many cases, bilingual parallels.

Thus the teacher will be prepared to respond to child expression and interest with selective reinforcement of the language that codes with precision, clarity, and aesthetic quality, to say nothing of modeling selectively.

It is important for the teacher to recognize that the enumerated areas are by no means exhaustive of all areas of cognitive growth. To be more detailed might tend to fragment the teacher's effort, hence the practical limitation to nineteen areas. (It may prove necessary eventually to extend the list in order to meet classroom needs.)

There is no pretense at organizing the areas. They have not been arranged in a hierarchical order from simple to complex because the spiralling nature of conceptualization

blurs such an ordering. Neither are they arranged sequentially according to the chronological order of mastery of concepts because the overlapping of areas tends to confuse the sense of sequence.

There has been no effort to present a comprehensive inventory of all possibilities of the language intrinsic to a specific skill. The example sentences are not to be used verbatim by the teacher for they are meant only to be suggestive of the kinds of language a teacher could adapt to a unique situation with particular children.

The inventory of language patterns is not intended to dictate the grammar that is to be taught. Rather, it provides the general range of patterns that the teacher could model in order to sharpen the intellectual process.

It is important for the teacher to collect samples of the child's language, her own language, and of the total interaction. Such samples are useful for the teacher's analysis of language and the child's intellectual need.

While conscientiously planning the learning environment so as to implement TEEM, the teacher must be at the same time evaluating her own language behavior. This must be done to discover whether she is also stimulating the child through the language concomitant of classroom activities.

Criteria for self-evaluation of teacher language are implied throughout *The Natural Method of Language Learning: Systematized*, but they are best developed by the teacher while increasing interaction sensitivity and linguistic sophistication. As a starter, perhaps, such queries as the following could guide the teacher in self-evaluation.

1. Is my expression responsive to the child or is it controlling and directing?
2. Does my expression invite further child involvement?
3. Does my language provoke further child inquiry?
4. Does my language heighten child awareness and sensitivity?
5. Are my structures complex and elaborated?
6. Is my language both concrete and abstract?
7. Do I talk in such a way as to encourage specificity?
8. Is my language dense in meaning?
9. Do I "play" with language so as to awaken the child to the aesthetic, to the figurative, and to humor?
10. Does my language enlarge concepts of the universe both time-wise and space-wise?
11. Does my language use tense variation, prepositional phrases, clauses, and modifiers?
12. Are my verbs "power-packed?" e.g., rather than saying the snake *moved*, I talk about sliding, writhing, darting, etc.?
13. Does my language encompass a wide range of selective synonyms?

A major query would be, "Do I first examine my language to be sure it has a mediating and coding value for the child, or do I feel compulsion to change and to correct child language?" The appropriate philosophical emphasis would be to examine self first.

It is hoped that the material which follows will increase teacher awareness of learning skills and will alert the teacher to the varieties of language intrinsic to the skills of learning to learn.

You will notice handwritten comments made by a teacher who has already perused this material. She has responded as

the authors had hoped, using the stimulus to generate more ideas and more creative suggestions. The bulletin is meant to serve as an appetizer to whet your appetite about language and cognitive implications of language.

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[1]The monograph was written by Arline Hobson and published in 1973 by the Arizona Center for Educational Research and Development, College of Education, University of Arizona, Tucson, AZ. It states the language philosophy used by the Tucson Early Education Model.

[2]Chapter II, p. 25: "Importance of Environmental Constraints."

LEARNING TO LEARN
Teaching Aims

1. To foster linguistic awareness
2. To heighten sensory perception
3. To arouse curiosity
4. To encourage imagination
5. To guide the child to differentiate fantasy from reality
6. To foster the creative process
7. To foster the habit of labeling
8. To foster identification and discrimination
9. To develop classification skills
10. To develop spatial comprehension
11. To develop time understanding
12. To develop the concept of quantity
13. To develop the concept of change
    - . spatial
    - . temporal
    - . textural
    - . developmental (growth process)
    - . cyclic
    - . atmospheric
    - . mechanical
    - . chemical
14. To produce awareness of cause and effect
15. To foster the practice of tentativeness
16. To teach how to choose
17. To develop the ability to be relevant
18. To teach planning
19. To facilitate problem solving (social and intellectual)

FOSTERING LINGUISTIC AWARENESS

The Importance of Linguistic Awareness

Watts (p. 145) quotes William James in describing the world of the newly born infant as a "big, blooming, buzzing confusion." Watts believes that the child passes out of this field of perception because of his mastery of the language instruments. While he is conceptualizing about his environment, he is discovering a language order in the speech sounds of his environment. It is this symbolic mediation through oral language that makes further conceptual development possible. The infant discovers the system and order of language by manipulation of sounds. This sound play leads him to the intrinsic system of his language. Continued sound play plus words and semantic play will lead the developing child to a more elaborated language with which he can better lift his thinking to higher and more complex concept levels.

Loban (p. 88) in his study, *The Language of Elementary School Children*, concludes: " .... Not basic sentence patterns but what is done to achieve flexibility within pattern proves to be a measure of proficiency with language at this level. Since formal instruction in grammar, whether linguistic or traditional, seems to be an ineffective method of improving expression at this level of development, one can conclude that elementary pupils need many opportunities to grapple with their own thought in situations where they have someone to whom they wish to communicate successfully. Instruction can best aid the pupil's expression when individuals or small groups with similar problems are helped to see how their own expression can be improved. For the pupils, the approach would usually be through models, and reasoning, rather than through the application of rules. On the other hand, the teacher would need to be aware of the structural problems behind the semantic difficulties and would be guided by research in determining what to emphasize and to ignore."

An adult, guided by such research, is aware of three systems functioning in the language, all needing emphasis. They are, according to Brooks, Hockett, and O'Rourke (p. 9-12), as follows:

1. The sound system which is always unique to each language.
2. Grammatico-lexical system consisting of "words, phrases, and significant parts of words . . . together with patterns by which larger meaningful expressions of various sorts and sizes can be built out of elementary ones."
3. Paralanguage or kinesics, which is the gestural element of communication. Codification of this system is not available and varies culturally.

The child enjoys play with words, often initiating such play. A linguistically alert adult can guide such interest by responding and joining in with such delight that the child feels very good about the activity.

Child initiative with enthusiastic adult response undoubtedly helps the child to feel good about his own

language learning. Teacher response should be at all three levels of language awareness as previously mentioned:

1. sound
2. words
3. paralanguage or kinesics

However, teacher modeling may be the child's first invitation to language playfulness. The classroom organization would include some structured opportunities for talking about talking. The situations would not and should not be drills. The following activities should help the child to reflect on and to talk about his own talking.

Brooks, Nelson; Hockett, F.; O'Rourke, Evertt V. *Language Instruction Perspectives and Prospectus*, Bulletin of California.

Loban, Walter D. *The Language of Elementary School Children*, Champaign, Illinois: National Council of Teachers of English, 1963.

Watts, A.F. *The Language and Mental Development of Children*, New York: D.C. Heath & Co., 1948.

LINGUISTIC AWARENESS— Classroom Activities

1. Use word games, riddles and written materials that help children discover that meaning is controlled by a change in position or stress.

   "As I read these phrases, listen for a difference in meaning and then we can illustrate the phrases for a book."

   Examples:
   1. HORSE fly; horse FLY
   2. HIGH school; high SCHOOL
   3. ROLLING pin; rolling PIN
   4. HOT dog; hot DOG

   "Can you think of some other phrases that change meaning through stress?"

   I asked, "Jerry, does your watch tell time?"

   He said, "Yes."

   "But that's not true, Jerry, because it didn't tell time; you had to look at it."

   "Let's read these newspaper headlines and try different stress patterns that could mislead a reader."

   Examples: *Draft card burners*
   Town well bombed

2. Provide time for drama and listening activities that demonstrate the power of juncture or pause within a word, between words or groups of words and between sentences.

   "What do I mean?
   1. Get along littl doggie.
   2. Get a long little doggie."

   "How many items were served at my birthday party? We had chocolate ice cream cake and candy."

   "Let's make up and act out situations that would change the meaning of the sentence: Give the punch to her mother."

3. Use choral reading, dialogue and creative movements to provide children with opportunities to discover relationships between pitch used in speech and the meaning of a sentence or phrase.

   "With your partners, see how the same sentence or phrases change meaning and even sound different as you make up situations when they might be used."

   Examples:
   1. A snake
   2. He's out
   3. I'm going
   4. Help me

   "Work in small groups to come up with as many different pitch patterns as you can for this. (Select one sample utterance above.) You could do some choral reading with it, and maybe you would even like to have a narrator set the scene before you read."

   "How many different meanings can you get from the following words by changing pitch patterns?"

   Examples: no, yes, please

4. Use written patterns, games and group discussions based on word order, word substitution and word form to help children describe, in terms of function, the language they have already used.

"Leticia said, 'The dog is running away.' What else could run away? Sure, Danny, a boy can run away. Let's list your ideas on the chalkboard."

Example: The	dog	is	running	away
	boy			
	horse			
	dinosaur			
	monster			

"How else can a monster get away besides running? That's an interesting idea, Rosie; he could be slinking away. I'll add your word to the sentence."

Example: The	dog	is	running	away
	boy		slinking	
	horse			
	dinosaur			
	monster			

"See if you can put your knowledge of word order to work on this game. I have picked 10 sentences from your stories, and the object of the game is to get as many meanings from each of the sentences as possible by changing the position of the words. No fair adding words. The group that creates the most sentences wins. We can vote on any sentences in question to decide whether or not it sounds like a possible English sentence."

Examples of sentences:

That mean 6th grader kicked my sister.
The Indian man painted a big picture of a horse on his wall.

"There are clues in word endings that give us facts, such as who, what, how many, and when. Listen to the tape of your choral reading and then we can work together to identify the facts contained in each sentence and what endings signaled this information."

5. Help the child on an individual basis expand and manipulate his verbal and written language.

"Benjie, I'm interested in knowing more about your pitching experience. You wrote, 'I pitched soft ball,' and your sentence seems like a teaser to me. Write your sentence again and add words that tell me where you pitched, when you pitched and how you pitched."

"Misty, I have retyped your story with blanks added. See if you can fill in some words that will help the art committee illustrate your ideas."

Example: My _____ brother lost his _____ dog _____. He likes to show his _____ teeth but he only bites _____ bad guys _____.
He has _____ long _____ fur.
He has a _____ collar.

"Let's add words to your sentence, David, so that it makes a picture in the reader's mind."

Example: The kids built a fort.

1. What words would help me know the kind of fort?
2. What words could you use to help me see a particular fort?
3. How did the kids build the fort?
4. What words might you add to tell where or when the fort was built?

6. Introduce technical aspects of phonics when the child is involved in personal language experiences that require their application.

"Alex, I can understand why you might have thought I wanted a straight pin rather than a pen. The two words, pin and pen, sound very much alike. Look at

these pairs of words and listen for the difference in sound.

Examples:

1. bin ben
2. tin ten
3. nit net
4. thin then

"Maria Eva, I'll bet you meant to write *Goldilocks sat on the big chair,* rather than *on the big shair.* Chair starts like chimichanga and chicken and — help me think of some other words that start with the letters ch."

"I think you can write the word bat. The first letter is the same letter that begins the words Betina, Benjie, Bullwinkle and book."

7. Always, teacher responsiveness to child speech should be reinforcing to the child's language initiative and should offer more adequate coding by modeling a more precise form or word. This elaborated adult response should sensitively avoid correction; e.g., the child who sees an oval platter as "round, but not really round" can be complimented for seeing differences and likenesses but can be told, "It is not a round plate, but it is an oval platter. You have very good eyes to see all that."

Saving dictated and tape recorded samples of the children's natural language is a great way to help the child evaluate his own language growth over the school year. Wouldn't it be great to hand these samples on to the child's next teacher and have a continuous growth record throughout a student's schooling?

Lots of work with rhyming words, antonyms, homonyms, synonyms & idioms are essential for the development of linguistic awareness in children learning English as a second language.

LINGUISTIC AWARENESS — Situation:
Evaluation Conference Student-written Script

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	I have a few questions concerning your script. What do you mean by the line, "There's the dancing teacher."?	
Child:	You know!	
Teacher:	I'm not sure. Do you want to say that the teacher is dancing or that she teaches dancing?	Stress
Child:	Oh, yea, she teaches dancing. The dancing teacher.	
Teacher:	Now I understand what you mean. The way you stressed dancing was the clue. If you had said, "The dancing teacher," you would have meant the teacher was dancing.	
Teacher:	In the party scene, the host says, "Give some cake to her baby." Is he calling the maid "baby" or does he want the maid to give a piece of cake to an infant who is at the party?	
	(Laughter)	Juncture
Child:	She gives cake to a little baby.	
Teacher:	O.K. I guess I was pausing after the word "her" and that's what confused the meaning.	
Teacher:	How will the teacher's part be read?	
Child:	What do you mean?	
Teacher:	Will the teacher talk in a mean way to the kids at the party? How will she sound?	Questions or statements. Tone of voice affecting meaning.
Child:	She's not real mad; she just wants the kids to be good. She talks in a grown up, grumpy kind of voice.	

Teacher's and Child's Language	Analysis of Teacher's Language
Teacher: I got a kick out of the way you writers played with rhyming words. Child: Where did we play with words? Teacher: Here, in the maid's line, where she is screaming about the fat rat sitting on the bath mat. Maybe you could even use some more word play in the maid's other lines.	Reinforcement of child's linguistic skills. Aural awareness of sounds, using minimal pairs.
Teacher: The narrator's lines are beautiful. You use so many descriptive words that your audience will easily be able to visualize all of the off-stage action.	Statement directing attention to words and their effect on meaning of sentence.

HEIGHTENING SENSORY AWARENESS

The Importance of Sensory Awareness

For most people, whatever the age, the sensory level is the point of entry for new learning. Most learning originates in direct concrete experience. Again, whatever the age, the learner's grasp of the abstractness and of formal logical operations usually has its roots in the direct, concrete experience.

Continued openness to new information and to fresh experiences can make learning a life-long pattern. It is very important that keen sensory perception be developed and maintained even as a knife must be kept sharp if it is to cut. Unless the senses are keen, the human being is not quite alive. Open enjoyment and generous sharing of sensory experiences help a person to maintain this capacity for perception. What's more, an adult provides a model for a child to emulate, hence it becomes an obvious responsibility for a teacher to assume this role.

Fowler (p. 86) indicates that the earliest child concepts are "grossly incomplete, immediate, and little generalized." He refers to Piaget's distribution between the early mental structures of reality and the more formal logical operations. He speaks of the "long developmental distance" from one to the other. That distance may not be so long, and certainly is not uninteresting to cover, if an adult is available to help the child to comprehend the interrelatedness of his sensory experiences and to code his comprehension. For example, redness in one situation may signal danger and in another may symbolize life and warmth.

The more a child can experience something, the better he can understand. The more senses a child uses in getting information from the world about the world, the more knowledge he acquires, and the more aware he is of the world and its complex relationships.

The following classroom activities could be developed to heighten such awareness.

Fowler, William. "Concept Learning in Early Childhood," *Teaching the Disadvantaged Child.* New York: National Association for the Education of Young Children, 1966. p. 86-96.

SENSORY AWARENESS — Classroom Activities

1. The teacher can plan tasting and cooking experiences that capitalize on sensory impressions.

   "The peach felt soft enough to be ripe, and it smells like sweet juicy fruit, but boy, does it taste sour!"

   "Shake the peanut shell and see if you can tell by the sound if the nut inside is dried and rotten."

   "I love the smell of vanilla, but it tastes terrible to me. Are there certain foods that appeal to one of your senses but not to another?"

2. Provide a "touch-box" or bag that helps children focus on their senses of touch, smell and hearing.

   "Lupe said she felt something slick and hard that is about the size of a baseball."

   "Steven, are you confused over the fact that the item smells like a rotten egg but feels like a flower?"

   "It sounds like a tiny bell; does it have the shape of a bell?"

3. Provide objects for manipulation so that the child can directly experience and internalize the qualities of objects.

   "The wool does feel soft, Stevie, but not as soft as the piece of velvet."

   "Smell the opening of this green bottle and see if you can locate another bottle on the table that has a similar odor."

   "That's the fourth different sound I have heard you make using the tambourine. I wonder if each of these instruments can produce different noises?"

4. Help children identify the emotional impact that sensory awareness can trigger.

   "That slow cello piece makes Jim look sad every time he listens to it."

   "When the wind blows hard enough to knock over garbage cans and make my hair wild, I feel so excited that I want to run as fast as I can and scream my lungs out."

   "Why did you act so happy when you sniffed the air?"

5. Capitalize on the sensory experiences that holidays and seasonal change offer.

   "Anita said that when she thinks of Christmas she can almost smell the tamales cooking, yet the scents of pine and bayberry mean Christmas to me."

   "I know it's springtime when I see wild flowers start to bloom in the warm sunshine and hear the crickets chirp."

   "Can you guess what holiday I am thinking of? I smell hay and pumpkins. I taste candy apples and popcorn balls. I feel spider webs and black cats' fur. I see bats silhouetted against a yellow moon. I hear spooky noises."

SENSORY PERCEPTION — Situation: Guessing Contents of Touch Box and Then Tasting

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Hey, it gots kitty hairs!	Adjective following the linking verb "to be."
Teacher:	What interesting descriptive words you use! The object *is fuzzy.*	
Child:	It's kinda a ball.	Adjectives in a position before a noun.
Teacher:	Do you mean the *fuzzy thing* has a *round shape?*	Modeling multiple attributes.
Child:	Like a rubber ball, a little bit.	Adjectives following the "seem class" verb.
Teacher:	Does the object *seem flexible* like our jack ball or does it *feel soft* like the foam rubber indoor ball?	More precise coding of child awareness.
Child:	It's like the jack ball, but big. Futa!	Use of intransitive verbs like "seem," "feel," "smell."
Teacher:	You sniffed yours and it *smelled stinky.* Do you think the fuzzy soft object made your hand *smell bad?*	Be sure to accept the child's language and give him the English
Child:	Where is Anthony?	Adjectives following the "become class" verbs.
Teacher:	He *became unhappy* waiting for his turn and went outside. Perhaps we better limit each person to one touch and clue because I see Anthony is not the only one who *grew impatient.*	"un" prefix.
		"im" prefix.
Child:	I guess it's to eat.	Similes
Teacher:	Could it be food *like a ball?*	
Child:	No, like apple.	Nouns following linking verbs.
Teacher:	Oh, it's a *fruit.*	Modeling a supra class term.
Child:	Yea, a fruit. It's wet.	Transitive verb and direct object. Modeling both a [1] supra and a [2] sub class term.
Teacher:	John *feels* [1] *liquid.* Laura, do you *feel* [2] *juice?*	

translation during corrective feedback - eg. give word "stink" for "futa."

My children enjoy "play" with these words; e.g. "Do you feel funny when you feel the rotten spot in the apple?"

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Yea, they squished it.	Adverb of manner.
Teacher:	Someone squeezed *tightly*.	
Child:	They busted it.	Intensifier.
Teacher:	The fruit must have been squeezed *very* tightly.	
Child:	It's no good now.	[1] Synonyms
Teacher:	The fruit *skin*[1] or *peel*[1] has *burst*,[1] but it's *not*[2] *ruined*.[1]	[2] Negation
Child:	Smell it, I know now. You guess!	[1] Questions requiring yes and no answers.
Teacher:	*Is it an orange?*[1] *Could it be an apple?*[1]	[2] Questions requiring information answers.
Child:	No, no, guess some more.	
Teacher:	*How heavy does it feel*[2] now and *how does it taste?*[2]	
Child:	It's about like the little truck and it's sweet.	Negation
Teacher:	Well, it *can't* be a lemon because lemons are *never* sweet.	
Teacher:	A cherry could be *sweet*[1] or *sour*[1] but a cherry would not be *as heavy as* our little truck.	[1] Antonyms [2] as . . . as . . .
Child:	You feel.	Adjective phrase.
Teacher:	I feel a wet, round, soft object *with a slimy spot*.	
Teacher:	I am touching something *that feels like a twig*. Perhaps it's a stem.	Adjective clause. "feels like . . . "
Child:	Me take it out.	Participle
Teacher:	You were right, Patrick. Look at this *pinched* peach.	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Now what are we gonna do?	Imperative sentence, simple and polite.
Teacher:	Taste it. *Would you please* hand me that sack? It contains more peaches.	
Child:	This one's the best.	Comparison of adjectives. [1] comparative [2] superlative
Teacher:	This peach smells sweet*er* [1] than that one. It's the juici*est* [2] too.	
Child:	Who said it?	Use of superlative
Teacher:	Patrick guessed *best*. He read the clues *most* carefully.	
Teacher:	*Oh!* [1] It tasted *so* [2] good!	[1] Exclamations [2] Intensifier

AROUSING CURIOSITY

The Importance of Curiosity

By nature, the human organism is continually exploring the changing environment. There is a continual processing and organizing of information.

The human organism is naturally exploratory and curious, but a child may learn to limit his curiosity if his environmental encounter is a negative one and if the adults in his life frustrate or discourage his curiosity. On the other hand, positive environmental encounters and encouragement by adults can set in motion a process whereby increased knowledge of environment prompts the child to ask questions about a wider environment.

Langevin (p. 371) attempts to label curiosity as some overall factors interrelating observing, thinking, questioning, specific and diverse exploring and choosing (p. 360-361). Differences among children in the degree of interest in seeking new experiences and differences in child persistence challenge teachers to keep the exploratory interest alive on the one hand even as they encourage the child to focus or to accept commitment to a task of specific inquiry on the other hand.

Nothing is much more infectious than the questioning mind. Curiosity begets curiosity both within a single mind and in the interacting social process. The adult has a responsibility to spread this infection to children. Such infection spreads if the child's encounters with environment, both physical and social, are such that he, personally, develops a burning drive to find out "how?" and "why?" and "why not?" and "for what reason?" and "in what way?" etc. The child's very own questions should arise just as easily outside as within the school environment and should prod him to use human resources wherever he finds them.

The notion held by many adults that "curiosity killed a cat," causes much adult irritation by or amusement at child inquiry rather than a serious involvement in cooperative searching. Many rigid adults, especially parents, advocate that the child simply be trained to meet objective standards and be tested for criteria set by adults. The teacher is so very important as an antidote to the above.

The following classroom activities are some of many that the teacher could use to arouse and to reinforce curiosity:

Langevin, R. "Is Curiosity a Unitary Construct" *Canadian Journal of Psychology*. Rev. Canad. Psychol. 1971,25(4). p. 371.

CURIOSITY — Classroom Activities

1. Encourage curiosity by valuing questions and allowing time for discovery, reflection and "day dreaming."

   "What an interesting question, Kenny. Would you like to check to see if the library has any information on Kung Fu fighting?"

   "I think most people have questions about death, Pat. Let's talk about your thoughts now while they are fresh on your mind."

   "I've never even wondered where the fireflies go in the day, but your questions sure have aroused my curiosity."

2. Help children anticipate coming events.

   "How would you like to celebrate your birthday?"

   "I'm so excited. My sister and brother-in-law and nephew are coming to visit me next week. I am planning menus around foods they like and rearranging the furniture so that my house will accommodate three extra people. I wonder if my nephew will remember me. I can't even guess how much he has changed during the past year."

   "What do you think the new principal will be like? Do you imagine he will change many things?"

3. Use guessing games and riddles.

   "I spy with my little eye something that's ————. What is it?"

   "What has eyes but can't see?"

   "What's in the bag?"

4. Speculate on unusual or novel experiences.

   "Do you wonder if the Dutchman's gold will ever be found?"

   "Why do you think the calf was born with two heads?"

   "What would happen if there were no school?"

5. Encourage the child to seek reasons for events.

   "How can we find out why our guinea pigs died?"

   "Why do you suppose your cake fell?"

   "I don't know why Michael hit you, Peter. Can you think of a reason?"

6. Respond to the child's individual interest with reinforcement and guide him to a wider focus of interest.

   "I can understand why you are so proud of your handsome new baseball cap, Harold. Seeing you wear it makes one wonder how many different types of head gear are worn by man."

   "Motorcycles are a thrilling means of transportation, Fernando. Do you think other forms of danger would make you feel the same way as a cycle ride?"

   "That butterfly you have been watching is fascinating, isn't it, Panchita? Do you ever wonder how birds and insects and airplanes fly?"

7. Maintain a continuous state of wondering even if an answer is not readily available; e.g.,

   "I wonder why that little bird is on our window sill every day." Don't press child for an answer.

8. Provide ample space and ample time for the child to manipulate materials such as an intellectual kit, making discoveries and wondering about things. Teacher response to child observations under such conditions should help the child to extend his/her questioning behavior; e.g., with respect to a shell collection, the child might group shells, commenting, "These shells are

in two parts. They fit together. These shells are all by themselves."

The teacher response would label bivalves and univalves and could say, "We have valves in our hearts, and there are valves in engines, too. Isn't that strange? What do you think about that?"

Surely, this would prompt some child enquiry about valves and functions and how they apply to shells, hearts and engines.

9. A teacher response is very important to child exclamations which may be wonder, or shock, or horror. The exclamation is often a signal for a need to code; e.g., reacting to a sonic boom a child might squeal, "Oh, What's that? That big noise shaked me."

   A teacher might respond, "One can really feel big noises. They can shake you. Sound comes in waves, too. I use sound waves all of the time. You do too, don't you?"

   "How? I don't know how I use them."

   This would lead inevitably to child enquiry to which the teacher can respond with sources for extending the knowledge of the science of sound.

Touch boxes are great motivators of curiosity. The children can be responsible for planning or bringing the contents.

AROUSING CURIOSITY — Situation: Guessing Game

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	What's you got?	[1] "Wh" question with a "do" auxiliary.
Teacher:	*What* [1] *do* [1] *you* [2] think Alex *has* [3] in the cardboard box, Maria?	[2] Use of stress. [3] Corrective feedback — replacing "got" in child speech with "has."
Child:	I don't know. A surprise? What's in it?	[1] Request for permission dignifies Alex's role as director of game.
Teacher:	May we guess the contents, Alex? [1]	
Child:	Yes.	
Child:	Hey, teacher, it moves.	[1] Interrogative of cause.
Teacher:	*Why* [1] do you *think* [2] the box moves, Maria?	[2] A verb of opinion implies possible alternatives for a reason.
Child:	You know.	Teacher response accepts indefiniteness of child's comment as evidence of many ideas.
Teacher:	What ideas are running through your mind?	
Child:	It's alive.	[1] Adverb of tentativeness.
Teacher:	*Perhaps* [1] the box does move *because the contents are alive.* [2]	[2] Adverbial clause of cause.
Child:	What is it, Alex?	
Child:	Guess.	
Child:	I don't know. A dog?	
Child:	No, that's stupid.	

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	Alex, give us some clues *as to how the contents move.*[1] *Maybe*[2] that will help Maria and me *to make*[3] intelligent guesses.	1. Adjectival clause of manner. 2. Adverb of tentativeness. 3. Infinitive as adverb.
Child:	Do you mean like fast?	1. Synonym for fast (adverbial) 2. Teacher indicates other possible characteristics of movement
Teacher:	Yes, it does move *quickly.*[1] Does it move *jerkily?*[2]	
Child:	Oh, it moves smoothly.	1. Reinforcement of child's idea. 2. Gerund. 3. Modal of probability (tentative) 4. Two-word preposition.
Child:	A fish moves smooth. It is a fish? Do you have water in there?	
Child:	It would come out. It's not wet.	
Child:	Maybe you got a plastic bag in there.	
Teacher:	*That's good thinking*[1]/[2], Maria. A plastic bag *would*[3] prevent water from *leaking*[2] *out of*[4] the cardboard box.	
Child:	Guess, Maria.	Teacher response again defers to child as director of game.
Child:	It is a fish?	
Child:	No!	
Child:	Help me, teacher.	
Teacher:	Alex, tell Maria and me more about your surprise. Give us a hint.	

ENCOURAGING IMAGINATION

The Importance of Imagination

A child who can think about places that are not present has imagination.

A child who can see now with his mind's eye the flowers that will bloom the next season has imagination.

A child who can be happy or sad with another child has imagination. We also call this empathy. This imaginative empathy helps the child to understand others better so that he can find better ways to work and share with others.

A child who can experience the story as if he were really part of the story himself has imagination. This ability of thinking "as if" is also called vicariousness. This makes it possible for a child to have a lot of fun, and it helps a child to solve his problems because he can see things as they might be under different circumstances. For the same reason the child can imagine himself in different circumstances and thus avoid making mistakes socially.

Pretending is a "fun" way of using and developing imagination, and the adult is really teaching the skill of imagining when she pretends along with the child. It's a very natural activity, and the adult by entering into the activity with the child tells the child that pretending is a good activity. However, the adult who helps the child to see that pretending is fun should also help the child to see it as "not real" or as a copy of the real. Sometimes some adults make the mistake of accusing a child of deliberate falsehood when he is really having difficulty separating the real from the unreal or from his imaginative pretense. This child needs adult help in identifying what is real and what is pretense, and he needs to know that both can be good.

Imagination is stretched by use of figurative speech. To talk about the wings of an airplane is factual labeling, but to say a plane is like a bird in flight is figurative. This is using a memory picture to help one to understand an actual visual picture.

To speak of the angry clouds is using human emotion to describe nature. This, too, is figurative.

Another kind of imaginative thinking is to see similarities between related pairs. For example, "Crowing is to a rooster as barking is to a dog." This is called analogy, and analogy is taken for granted in proverbs like, "A stitch in time saves nine," "A bird in the hand is worth two in the bush," etc.

To discover the differences between the literal and the actual meaning of idioms calls for imagination and is the basis for much humor and many jokes. For example, such idioms as "She blew her top," "He's in a stew," or "His eyes fell to the floor," when understood by the child not only increases his language control but adds humor to the thinking of the imaginative child. An adult can afford to model, explain, and laugh with a child about these idioms.

Life is so rich and so much fun for the imaginative child, that he can be expected to want to learn much more as his imagination grows. In the classroom, the teacher can encourage imagination with such activities as the following.

ENCOURAGING IMAGINATION — Classroom Activities

1. Use puppets, plays, flannel board stories, costumes, make-up and sets to allow children the opportunity to practice real life situations, express emotions and experiment with anti-social sentiments in a socially accepted manner.

   "That's the third person Mary Ann's monster puppet has eaten alive."

   "Today you must be the baby in the home center, Johnnie. I see that the members of your family are feeding you and dressing you and teaching you lots of new words by singing to you."

   "Liz's mask makes my hair stand on end. I'm afraid to even talk to her when she's wearing it."

2. Use analogies and metaphors to induce descriptive identification.

   "Use your imagination, Judy. Pretend that you are this roller skate. What can you do? How do you feel when someone puts their foot in you? Who do you like to use you the most?"

   "O.K., Francisco, you are a pencil at Ochoa School. Describe what you look like. How do you feel when children write with you? Do you like having your eraser used up? Tell us about some of your experiences."

   "Anna, how is a needle like your head? Is that a hard question? Well, first describe a needle and then describe your head so you can find the similarities and differences."

   "A rock is to a mountain as water is to a ————."

   "Listen to that motorcycle. It sounds like a cat purring. That engine purrs."

3. Encourage descriptive language of feelings and distinctions between feelings.

   "What do you think the color of sadness is? Why? What color would anger be? Why did you pick that color?"

   "I saw a little boy crying so hard this morning. What do you think might have been wrong? What could have happened?"

   "How does your stomach feel when you're scared, Terry? Do you feel different inside when you are angry and want to yell and scream and hit? Draw a picture of what you think you look like inside when you are afraid."

4. Help the child express his imagination through his movements.

   "Imagine a tremendous mountain moving. Show the feeling of a mountain through your movements."

   "Make up your own 'sad' dance."

   "This trio is to work together in movement and show the feeling of an egg beater."

5. Have children project themselves into another time or place or role to help them generate information based on a given set of information.

   "Carlos, you are an Indian at the first Thanksgiving. What did you think of the Pilgrims when they first came to your land? What do you think of white men now?"

   "If you were the principal of Ochoa School what changes would you make, Jose?"

   "Imagine that you are standing alone in the desert and a flying saucer appears above your head."

6. Help children develop their imagination through the use of similes.

   "How many different similes can you make out of these unfinished sentences?"
   The coyote is a tricky as ————.
   At night, Ochoa School is as dark as ————.
   As quiet as ————.
   The desert rain is like ————.

   "Juan, when you said the baby was like a shriveled prune, you used a simile. Let's collect and record all the similes we hear at school and home and even from T.V. We could make a class list or you each might want to make your own book of similes."

   "As I read this poem to you, listen for the similes."

   "Tommy, can you slither like a snake? Climb like a coatimundi? Walk like a tarantula?"

7. Help children become aware of the role imagination plays in religion and mythology.

   "IM NOT SURE WHAT Jesus looked like, Belinda. Artists have portrayed him in many different ways. What kind of picture do you carry of him in your mind?"

   "Lots of children pretend to be witches on Halloween night, Josie, but did you know that some adults say that they really are witches?"

   "Imagine yourself in a heaven. Where would it be? Who would be there with you? What sounds might you hear? What odors could you smell and what colors would you see?" *

8. Provide activities requiring originality.

   "See if you can invent some new words to describe your fellow classmates. You can draw a picture of someone in the class and then describe that person with your very own words."

   "I'm not sure who first thought of a machine like our typewriter, Jose. We will have to look for that fact in the encyclopedia when we go to the library this afternoon. It is a wonderful machine. It helps me record things much faster than by hand. If there is something that you would like to do better or faster you could invent a machine that has never been heard of. Then I could say, 'This is my student, Jose, the famous inventor!' "

   "Now that you have the clock apart, what new thing can you build with the pieces?"

* If your children are from a non-Christian background, you must show interest in their beliefs; e.g. my Hopi students have a very different view of the cosmos.

Music is a good motivation for imaginative activities.

ENCOURAGING IMAGINATION — Situation:
Discussion after a Listening Experience

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	That was good. It was spookie. The monster was ugly and spookie.	[1] Verb "imagine" [2] Adverbial intensification of an adjective [3] Vicarious use of "see"
Teacher:	I'm so glad you enjoyed the radio mystery, Eddie. So you [1]*imagined* the monster to be [2]*frightenin*gly ugly! The descriptive words the actors used made me [3]*'see'* a large, mangy, drooling gorilla type of monster.	
Child:	It's better than T.V., huh?	
Teacher:	The radio is very exciting to me too, Rene, *because I can visualize the characters and settings just the way I want them to be* and you may imagine things quite differently.	Clause of purpose
Child:	Yea, I thought it was like Dracula. See my teeth. I'm Dracula.	
Teacher:	Oh, please, Dracula, don't bite me on the neck with those long white fangs. My blood is poison and it will give you a stomach ache.	Teacher involved in pretense of the play.
Child:	O.K., but next time I'll get you.	
Teacher:	It's fun to *pretend* with you, Rene.	Verb "pretend"
Child:	Could we make a play? A Dracula play?	
Teacher:	That's a wonderful idea. You might even want to *try your hand* at a taped radio-type show.	Idioms
Child:	Hey, I'll be the monster and Belinda can be the lady I bite and who else wants to be in the show?	
Teacher:	*Now you're cooking.* It looks like you are *in full command,* Rene.	

This whole area cross-classifies to the following area about fantasy + reality - imaginative subjects need not confuse reality.

DIFFERENTIATING FANTASY FROM REALITY

The Importance of Differentiating between Fantasy and Reality

Wann, Dorn, and Liddle (p. 55) quote Susan Issacs who claims that English children past the age of three years rarely confuse reality and fantasy no matter how intensely they play at make believe. Perhaps one can conclude from this that a child is able to differentiate at that age. However, such differentiation can be delayed and perhaps completely frustrated by the mythological instruction of the community.

Issacs warns the adult not to confuse the child's ignorance with his belief. For example, "The child does not believe that everything is alive; he simply does not know that 'everything is not alive.'" When the teacher identifies such lack of knowledge, she has an obligation to structure the situation so that the child can discover the knowledge necessary to dispel his erroneous concepts that tend to be animistic. For example, some Tucson children comparing two fairly new popcorn poppers and one old popper spoke thus:

"That one was born first," said Denny.

"He's the oldest one. He was made first."

Guiding Denny from an animistic view to reality, the teacher replied, "Yes, this popper is the oldest. It was made first."

Bruner (p. 36) speaks of the "mythologically instructed community." Such instruction very often is the basis for religious motivation and practice and many create a barrier between the child and the scientifically oriented teacher or may separate ethnic groups. Such a barrier may be less formidable if the child can, for himself, discover the reality of the universe. In that way he is more likely to divorce himself from the restrictions of the myth of his culture and thus see it as a myth. For example, a Papago Indian teenager, pressed by her peers to decide whether a particular legend of her people was true said, "No, it's not really true, but it is true in a sort of a way." In her own way she saw the myth as symbolic but was not confused about reality and fantasy or myth.

Although fantasy should not be used to obscure reality, we should recognize that fantasy has both an aesthetic value and a mind-stretching value. After all, reality is really beyond definition and description. Fantasy with its built-in imaginative searching and speculation, paradoxical as it appears to be, is not in conflict with scientific pursuit. It may point the way to new discovery. Great scientists, after all, are known for playing with ideas.

The following are suggestions for helping a teacher to guide the child to differentiate between reality and fantasy.

Bruner, Jerome S., *On Knowing, Essays for the Left Hand*, Cambridge, Mass: Belknap Press of Harvard University Press, 1962.

Issacs, Susan, *Intellectual Growth in Young Children*, London, England: Routledge and Kegan, Paul, 1930.

Wann, Kenneth D., Dorn, Miriam Selchen, Liddle, Elizabeth Ann, *Fostering Intellectual Development of Young Children*, New York: Bureau of Publications, Columbia University, 1962.

DIFFERENTIATING BETWEEN FANTASY AND REALITY — Classroom Activities

1. Identifying any story that is shared in the group as possible, probable or make-believe.

   "Martha said she got the idea for her bear story from the fact that her aunt really did fall on top of two beehives, so the situation is possible."

   "Juan, tell us, did that happen or is it make believe?"

   "Why do you think I called my story a fantasy?"

2. Conversion of a child's metaphor to a simile to be sure he is not confused about reality.

   A. Child: "The weather can't make up its mind today."

      Teacher: "Yes, the weather today is like a man who can't make up his mind."

   B. Child: "My dog got married and had seven puppies."

      Teacher: "How exciting for you to own eight dogs! You know, Eddie, I love my dog so much that she does seem like a person, almost like a member of my family. It isn't hard for me to imagine either that a dog could do human things such as getting married or even talking."

   C. Child: "The coke machine stole my money."

      Teacher: "That machine is like a burglar who robs your money."

3. Discuss fantasies that have turned or could possibly turn into realities.

   "When I was a little girl, stories about rocket ships were make-believe stories because there were no rocket ships twenty-five years ago, just ideas and stories about them."

   "Some people speculate that in the future humans will look very different and get their nourishment from pills rather than food as we know it. Do you think that might happen?"

   "Edmundo believes that God is not real, and Sara says God is true. How would you know if God is real or make-believe?"

I must find ways, however to keep alive the aesthetic values of figurative language.

Role playing is a good way for children to experience both make-believe and true-to-life situations. The children can identify the characters they are playing as fact or fiction.

FANTASY — REALITY — Situation: Discussion of a Story Authored by Child

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	. . . and so the dinosaur ate the man's foot off. The end.	Questions and statements identifying reality and pretense.
Teacher:	Boy, does that ending scare me. Your story is make-believe though, isn't it? It's not true.	
Child:	Yea, he really didn't bite the foot off.	Questions seeking confirmation of occurrence.
Teacher:	Where did this happen and when did your story take place? *	
Child:	It was a long time ago but God [1]*didn't really* make the man yet, just the dinosaur.	[1]Adverbial expression of doubt [2]Subjunctive modals [3]Adverb of confirmation of fact
Teacher:	Then it [2]*couldn't* happen? How [2]*might* a man [3]*really* get his foot bitten off?	
Child:	A machine could do it or a big lion.	[1]Tentativeness labelled [2]Imperative sentences directing the child to reality or to fantasy; e.g., let's pretend. [3]Vocabulary identifying the real and pretense.
Teacher:	Those are [3]*real* [1]*possibilities*, but your [3]*make-believe* story is much more colorful. [2]Let's [3]*pretend* again next time we write stories.	
Teacher:	Now I'll read a story to you and you tell me if it's real or make-believe. Listen to answer this question: Why is it the truth or fantasy?	Questions or requests to encourage the child to distinguish between fantasy and reality.

* One question at a time! Too often children are overwhelmed by a series of questions and do not respond at all, even when the questions are very open.

There is a hazard of making fantasy take second place to the "real honest-to-God truth". I think we as teachers can help children view fantasy as an aspect of creativity rather than childish nonsense that borders on lying.

NURTURING CREATIVE PROCESS

The Importance of Creativity

Although little is known about the creative process, most teachers claim to value it. The nurturing of the process is so obviously related to the quality of adult attitudes in responding to child behavior and expression that the beginning level of such nurturing must be within the teacher herself. In order to model an appreciation of creativity the teacher needs first to look within herself to consider whether she is developing her own creative potential.

The concern of a teacher for self and for student is for the process of becoming creative rather than identifying the creative and superior product. What are the characteristics of the process?

One basic ingredient is the capacity to tolerate ambiguity and to see two sides of a coin. Therefore, the fact that many people make intuitive leaps rather than carefully and logically thinking through hierarchial levels excites rather than disturbs the creative teacher. Some of the very orderliness of the learning to learn skills may seem to contradict the creative process. There is no problem when we can accept the fact that two apparent opposites can both be true at the same time. This may be demonstrated by the fact that very creative people may sometimes appear untidy and slovenly. Closer observation often reveals that their commitment to attaining a goal is so absorbing that they waste little time with the nitty gritty of superficial tidiness. Many are both untidy and yet orderly. Also, Bruner insists that creativity requires structure within the child while he can be stifled if an overstructured teacher demands conformity.

If the child is being creative he is less controlled by the environment than he is by his own personally-developed goals. He is daring and willing to take risks to achieve his own goal. We teachers need to ask if we appreciate and support such self-motivation.

According to Taba (p. 248) creative potential is possessed to some degree by all and is not synonymous with "gifted." Guilford (p. 9) pointed out that there are many underachievers with respect to creativity but very few overachievers. Taba (p. 248) suggests that to cultivate creativity is to cultivate the growing edge of a child's potential in whatever capacity he is growing.

What are some of the characteristics of creativity? What should we be nurturing? What are we inhibiting, if we have so few overachievers?

A creative person has a capacity to reorganize and to see things and ideas from more than one point of view. He is flexible and therefore adaptable.

A creative person is self-directing, less concerned with the goals of others than with his own. He holds himself in high esteem.

A creative person is open to his environment, with keen sensory perception and a marked curiosity. This openness contributes to flexibility and a freshness of perception.

A creative person is a divergent thinker, able to make association with other previous experiences. He possesses an intellectual fluency.

The creative person has a sense of humor and a capacity for joy. He is imaginative, elaborating on, transforming or changing ideas. This leads to originality and to the production of novel and unusual ideas and things.

Some suggestions follow to offer a few ways in which the teacher might nurture the child's creative potential:

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[1]Bruner, Jerome S. "Principles of Structure and Creativity" *The Process of Education*, New York: Vintage, 1960

[2]Guilford, J.P. "Creativity: Yesterday, Today and Tomorrow," *Journal of Creative Behavior*, Creative Education Foundation, State University College, Buffalo, N.Y., 14222, Vol. 1, No. 1, 1967.

[3]Taba, Hilda, "Opportunities for Creativity," *Education for Exceptional Children*, Council for Exceptional Children, National Education Association, Washington, D.C., Feb. 1963. pp. 247-256.

CREATIVITY — Classroom Activities

we as teachers often equate unfinished work with laziness and poor work habits.

1. Let the child see you as a learner and creator.

   "I would like to read a story to you that I authored."

   "I can understand your frustrations, Lynn. I'm writing a poem also, and I can't seem to fit all of my feelings into the haiku form."

   "Last night at my dance class, I created my own anger dance. How many different ways can you show the feeling of anger in movement?"

2. Join the children in having fun with language through the use of puns, tongue twisters, alliteration, speech rhymes and unexpected placing of juncture, pitch and stress.

   "Peter, please put the papers in a pile on the piano."

   "Judy, be a cutie and do your duty."

   "What do you mean, 'can I eat teacher?' I'm not going to let you take a bite out of me!"

3. Help children experiment with the flexibility inherent in language by providing opportunities for them to rearrange words, phrases, clauses, sentences and punctuation and to expand, substitute, compress and delete material.

   "What other words might you use that would express your feeling better than the word 'mad'?"

   "Let's try to combine these four simple sentences into one interesting sentence."

   "How else can you say that?" Maybe I should have said, "maybe you can help me to say it a better way. Thus, I let students know that I, too, can improve speech. 27

4. Introduce the technique of making and possibly recording *unfinished* verbal sketches of situations, poetic ideas, characters and episodes so that the children will realize that painters, composers, print makers, all artists, make many such studies that they might ultimately finish but feel no obligation to do so. These studies, though discontinued at some stage, serve their purposes in the creator's mastery of materials and media.

   "Cracking, crumbly rotten teeth is a very descriptive phrase. Let me write it down for you to keep and perhaps use someday in a story or poem."

   "If you can't think of an ending for your story, put it away for awhile. New ideas may come to you, Tommy, or you might want to scrap the plot altogether."

   "Let's use the tape recorder to record your description of make believe story characters."

5. Give recognition for new and/or different ideas even if they seem wild or aggressive.

   "A school without teachers is an interesting idea, Steven. Tell me more about it."

   "That's a possibility, Sergio. The earth could be a ball for God to play with."

   "Jean, I never would have thought to use an umbrella for a measuring tool!"

   "We won't rule out flying across town to Randolph Park, Jenny, but I'm not sure how we could arrange that type of transportation. Do you have some ideas?"

6. Provide opportunities for children to learn on their own following their individual work time patterns.

"I won't be free to help you solve the word puzzles in the book you brought, Dolores, but I'm sure you will think of other resources available to you."

"Take your time and see what you can find out about these new math tools."

"You have worked on your story for almost three hours straight, Carlos. You must be enjoying writing today."

7. Accept student-initiated competition.

"Oh, now I understand. You and Steven are competing to see who learns all the names of the Major League players first."

"Well, Julie, if we have a poetry contest for the people interested in competing, you will need to think about how the poems would be judged and who would do the judging."

"Why don't you use a stop watch if you want to find out who has the best time in the race."

I have seen creative children turn into discipline problems because their work habits did not coincide with a 45-minute committee work period. (And guess what - I saw it in my own classroom!)

CREATIVE PROCESS — Situation:
Brainstorming Session

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	What's that present for?	Novelty introduced.
Teacher:	This is a surprise for the class.	
Child:	What is it?	Chance-taking.
Teacher:	Guess!	
Child:	I don't know.	Encourage daring thought.
Teacher:	*Take a chance and guess.*	
Child:	A new game?	Tentativeness
Teacher:	Well, a game *could possibly be made* from the contents of this package.	
Child:	Well, is it a game?	Openness to a variety of ideas. Tentativeness Encouraging inventiveness.
Teacher:	In my opinion someone might be able to make up a game using the contents of this box.	
Child:	It's not a game.	Openness to varied opinions.
Teacher:	Open the present, Alberto, and give me your opinion.	
Child:	It's junk.	Encouraging fluency or play with ideas, e.g., "your bias," "thought provokers," "What can I do with . . . "
Teacher:	That's your bias. I consider these items thought provokers. *When I look at all of these materials* the first thing I think of is — *What can I do with this?*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	You can glue it on paper and make a picture.	Reinforcing ideas for utilizing materials. Dignifying and appreciating the child's idea. "first" suggests more ideas are welcome.
Teacher:	That's our first idea, Eddie. Thank you.	
Child:	We could make a robot.	Encouraging fluency of ideas.
Teacher:	Good, the more ideas the better.	
Child:	We could make a car or something.	Encouraging flexibility and originality. Uniqueness, also, is encouraged.
Teacher:	That's possible. Here, let's move this hardware around and look at it from a different angle. Maybe a new perspective will help us think of something no one else has ever done.	
Child:	Let's build a machine that cleans up our room so we don't have to.	"one of a kind" recognizes uniqueness.
Teacher:	I'm sure it would be the only one of its kind.	
Child:	It could have a lot of arms. We could make the arms out of these pipe things. It could talk and sing.	Appreciation of uniqueness.
Teacher:	Wow, your machine sounds quite unique.	
Child:	No, I don't like that idea.	Encouraging flexibility and fluency of ideas.
Teacher:	I'll bet you can think of a different idea then, Mary Helen. How different can you be, Mary Helen?	
Child:	We could make a monster cage and catch Dr. Scar.	Reinforcing fluency and originality. Summarizing, recalling.
Teacher:	I think that's the fifth idea you people have come up with, and each idea has been unique.	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Let's sell this junk and buy something good, like hot wheels.	Reinforcing fluency and originality.
Teacher:	That's another way to look at the whole situation. Up until your suggestion, Tony, we have only considered making things out of these items.	
Child:	Can we sell it?	Dignifying the contributor.
Teacher:	Sure, Tony	
Child:	Nobody will buy it, Tony.	Dignifying the contributor and supporting his idea.
Teacher:	Let's go ahead and try to sell it, Tony.	
Child:	Hey, I know where that junk came from! You saved it from our clean-up walk last week, didn't you?	Reinforcement of fluency.
Child:	You asked us last week if we could use these things, huh?	
Teacher:	You had a lot of good ideas then, too. Do you remember?	

FOSTERING LABELING

The Importance of Labeling

As a child increases his ability to interact with other living things in his environment, his use and understanding of accurate labels will facilitate communication. Mental pictures may develop before the words are learned to describe them. Pictures alone have little potential for transfer and require translation into verbal expression before they can be received by another person. Verbal expression in the form of labeling helps the child in three important ways:

a. it facilitates specific identification;
b. it develops the ability to group and to classify;
c. it leads to multi-level labels with increased awareness of supra classes and sub classes.

These three processes are necessary to the mental development of the young child and can be learned by him. Precision in labeling can also grow from simple naming of objects, living things and events into use of descriptive phrases and figurative language.

Thoughtful use of pronouns by the modeler and conscious effort to use the noun more frequently will make the appropriate labels more available to the child.

Classroom activities can be planned to make maximum use of opportunities for labeling. The adult can foster the habit of modeling labels in such experiences as suggested by the following samples.

LABELING — Classroom Activities

1. Informal but frequent use of names, titles and/or locations to give information or direction.

   "Mrs. Odell is our school nurse. She is going to weigh us today."

   "Our janitor is Mr. Jacobs. You will find him in the custodian's office."

   "The principal's name is Mr. Valdez. That's his name on the door of his office."

2. Consistent verbal labeling of classroom objects, areas and activities.

   "The aquarium has to be cleaned today. Get the large glass bowl under the sink and we'll transfer the goldfish."

   "You'll find the fabric scissors on the top shelf of the cupboard behind my desk."

   "Put some waxed paper on the long table before you lay your mosaic on it."

3. Frequent use of visits to other parts of the building, playground or community.

   "Miss Butler is in the principal's office. She is ready to show you how the ditto machine works."

   "The sixth graders from Mr. Romero's room want us to see their rockets. We are going to meet them near the basketball court on the playground."

I must be mindful of cultural variations about kin. For example, Navajo cousin is "sister" or "brother"; societies called "cousin-sister" or "cousin-brother".

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   "The butcher at the supermarket said our class could come to see how he makes hamburger. We can walk across Twelfth Street and go through the parking lot."

4. Use of mapping situations to involve children in use of directions for walks, field trips, etc.

   "Patsy's house is on Seventh Street. How many blocks is that from the front entrance of our school?"

   "The Post Office is four blocks from here. What streets will we have to cross to get there?"

   "Paul wants to use one inch to show one block on our map. That's a good scale to use on this size paper."

5. Awareness of kinship relations.

   "Connie's cousin Frank is in the fourth grade. She is going to his room to borrow a hamster he promised to let her have."

   "Peter's uncle is our mailman. That's why they have the same last name."

   "Julie and Mary are both Jerry's sisters."

6. Use of objects which have labels in common as well as a specific name.

   "Martha is holding the slotted spoon."

   "John has found a special spoon we call a ladle."

   "The grapefruit spoon has a serrated edge to cut the sections easily."

Labels can also specify action:
e.g. The snake wiggles.
The bird flies.
The duck waddles.

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LABELING — Situation: Examining a Kitchen Tools Kit

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	To pick punch.	Nouns to identify. Modeling use of noun in context.
Teacher:	You're right. The *ladle* is used to serve punch.	
Child:	Give me the thing with holes.	Appropriate use of pronouns with referrent (grater) clearly modelled.
Teacher:	Mary can't hand you the *grater* because she is helping me grate the cheese with *it*.	
Child:	Where is the other grater?	Proper nouns.
Teacher:	*Jim* took it back to his grandmother in *Nogales*.	
Child:	Is this a tool?	Predicate noun or noun following verb "to be" to name the subject and to label supra class.
Teacher:	You bet the peeler is a *tool*. All of the utensils we are working with are *tools*.	
Teacher:	What could we use to mix the batter? What tool do you need?	Questions to elicit labels.
Child:	A cutter.	Noun adjunct or noun used as an adjective.
Teacher:	The *steel butcher* knife does cut.	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	See what I have.	Labeling categories: [1]Common noun [2]Adjective phrases [3]Label for sub class [4]Sentence identifying function of specific object. [5]Specific label.
Teacher:	All of your [1]*tools* [2]*with blades* are [3]*knives.*	
Child:	It's got a blade.	
Teacher:	What makes you think that? You really picked up on that clue. [4]*This flat bladed knife spreads butter.* It is a [5]*butter-spreader.*	
Child:	You call these knives?	[1]Labels within a sub category [2]Label of a supra category [3]Encouraging child to extend category
Teacher:	Yes, both the [1]*butter-spreader* and the [1]*cake server* are used as [2]*knives.*[3] What other objects could we use for a knife? (Be sure to give the child thinking and answering time.)	
Child:	It cuts you.	Adjectival modification [1]adjective [a]after verb of "being" [b]before the noun [2]phrase [3]noun adjunct [4]participle [5]clause
Teacher:	The bread knife is [1a]*sharp* and the [1b]*serrated* edge [2]*on the blade* could cut you.	
Child:	Here's the [3]*spatula* turner.	
Teacher:	Yes, the spatula [2]*with the red handle* is [4]*broken.*	
Child:	It don't work.	
Teacher:	The egg beater [5]*that you wanted to use* has been found.	
Teacher:	Let's put the [1]*cooking* utensils away. Where's the [2]*broken* egg beater?	Participle [1]present [2]past

Have found that children acquire new labels quickly if I tell them the reason I am modeling the names + that learning new vocabulary is an important job. Ex: "These are the tools we will use at the math center today: a 12-inch ruler, a pencil and compass and three lengths of twine. I will use the names over and over as we work together and I hope you will be able to name all 4 objects at the end of our committee period.

DEVELOPING IDENTIFICATION AND DISCRIMINATION

The Importance of Identification and Discrimination

Probably the earliest evidence of a child's capacity for identification is his ability to recognize that an object exists all the time. A child acquires this "object constancy" before he can talk. The concept is interwoven with an awareness of the attributes which characterize the object such as space, form, time, color, size, etc. The child must be able to distinguish in three ways before he can grasp either permanence or the salient attributes of an object. He must know:

a. that objects exist independent of the person;
b. that the person himself can be an object;
c. that the object can be independent of its environmental background.

Identification across multiple situations, so necessary for the transfer of knowledge, helps the child to separate things and ideas out of a background or to abstract them from their usual familiar context. Appropriate labeling of the object across varied settings again frees the idea from the moment and the immediate.

For the teacher the following classroom activities provide for a transfer of the identification and discrimination process.

IDENTIFICATION AND DISCRIMINATION — Classroom Activities

1. Dignifying and encouraging verbal expression of shades of emotions.

   "Judy, you frightened me with that rubber spider, but I can tell the joke delighted you."

   "Your face shows me that something is worrying you. I get wrinkles on my forehead too when I'm anxious or annoyed."

   "I feel so excited and nervous because of our performance that I have butterflies in my stomach. How do you feel?"

2. Comparative tasting of related foods to develop descriptive language and reference for discrimination.

   "This Pippin doesn't taste nearly as sweet as the crisp Golden Delicious apples we sampled last month."

   "It's hard to guess from the texture, shape or weight of these dried apple slices that they actually originated from round juicy apples."

   "How do you think we could produce the same quality apple sauce from these tart apples as we did from the Washington Beauties?"

3. Constant use of open-ended questions that demand comparisons be made by children.

   "What could we substitute for the missing ingredients?"

   "How have your feelings changed toward being a committee chairman?"

   "What made you select this picture over the other five?"

4. Recognition and identification of different speaking and writing styles.

   "I don't think this story was written by Mary because she usually uses peoples' proper names rather than pronouns like he, she or they."

   "This story reminds me of a book written by E.B. White. I wonder what it is that makes me connect the two authors?"

   "Can you guess who in our room might have written the story at the beginning of the year?"

5. Acknowledgment of child's auditory discrimination.

   "You have sharp ears to discover that chair begins with the same sounds as chimichanga."

   "You're right, Juan. The glass bell does sound different than the brass bell. Can you find another bell that has a high tone like the glass one?"

   "Julie says that she hears a strange hissing sound. Let's listen and try to find out where the sound is coming from."

IDENTIFICATION AND DISCRIMINATION —
Situation: A Walk to Santa Cruz Church

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	It's the biggest place because it goes way up. A hundred people go in there.	[1]Sentences describing attributes; i.e.: a. spatial c. size b. form d. mass, etc. [2]Noun plus linking verb plus noun [3]Superlative adjective form
Teacher:	How observant of you.[1&2]Santa Cruz Church is the *tallest*[3] building in our neighborhood. Its rectangular shape covers over half of this block. I'll bet you have counted the people attending Mass to arrive at your estimate of 100.	
Child:	They got lots of doors.	[1]The auxiliary "do" for emphasis [2]Adjectives preceding nouns [3]Open-ended question [4]Modal expressing the subjunctive
Teacher: *	Santa Cruz [1]*does* have [2]*many* [2]*colored* doors. [3]How [4]*might* we find out the [2]*exact* number?	
Child:	What's this made out of?	Nouns plus transitive verb plus direct objects. Passive verb.
Teacher:	*Masons built the wall* by laying bricks and then plaster was spread over the bricks.	
Child:	All the houses are adobe.	[1]Demonstratives [2]Idiomatic verb (preposition becomes part of verb)
Teacher:	[1]*This* house is made out of adobe brick, but [1]*that* house with the sloped roof seems to be [2]*made out of* another type of brick.	
Child:	Does an Indian live there?	Questions using interrogatives specifying: [1]How [2]Who
Teacher:	I don't know. [1]*How* could we find out [2]*who* lives in that blue trailer?	

* The teacher's language level may have been responsible for the student's lack of response. I could have said, "Let's count the doors and find out how many there are."

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Look!	Noun labels [1]common [2]proper
Teacher:	Wow! From the top of this [1]*wall* I can see a [1]*motorcycle* driving up [2]*"A" Mountain.* I think that green [1] *area* is a [1]*park.* It could be the new [2]*Model Cities Park.*	
Child:	I know who lives there.	Possession: [1]noun [2]pronoun
Teacher:	That's [1]*Juan's* house, isn't it?	
Child:	Uh uh.	
Teacher:	It's not [2]*his* house? Well then, give me a clue, Julie.	
Child:	My house is the biggest.	Comparison adjectives [1]"er" suffix [2]"more"
Teacher:	Your house is [1]*taller* than Mary's but Mary's house has [2]more floor space.	
Child:	You don't know where I live.	Subordinate adjective clauses
Teacher:	Ha-Ha, Steven, I do too know *which house you live in.* That's *where you live* and next door to you is the house *where Mr. Ortiz lives.*	
Child:	That car is the same as yours, huh?	[1]Similarities noted [2]Differences noted [3]"but" — a conjunction to introduce a qualifying clause
Teacher:	It does look [1]*very similar* to my Datsun, [3] *but* there [2]*are a few differences* that I'll bet you can identify.	
Child:	I'm so hot.	Simile
Teacher:	I can tell. You have *cheeks like roses.*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	She said that's where Jerry lives.	Negation
Teacher:	I *don't* think so. It's Albert's house, isn't it? There's *no* fence around Jerry's yard.	
Child:	Nobody's home!	Adjective of feeling
Teacher:	Are you *worried* about your grandmother? Where might she have gone?	
Child:	It's way up, huh?	Synonyms
Teacher:	Your tree house is very *high* off the ground. It's so *tall.*	
Child:	I'm so tired.	[1]Synonyms for close distinctions [2]Negation used to clarify distinction between synonyms
Teacher:	I'm [1]*tired*, too, but I'm [2]not [1]*exhausted* yet.	
Teacher:	Look at that *t[illegible]mendous* Great Dane next to the *tiny* Chihuahua.	Antonyms

DEVELOPING CLASSIFICATION

The Importance of Classification

Organizing grows out of a "push for order" which can be easily observed in the young child's activities. This is supported by his increasing skills in labeling, identifying and discriminating. Using these skills, the child eventually develops a habit of grouping as he establishes relationships through recognition of common characteristics. Personal autonomy gradually emerges as the child, himself, brings order to his immediate environment, sometimes by finding likenesses or differences, but also identifying such relationships as cause and effect or kinship bonds.

Watts, A.I., *The Language and Development of Children.* New York: D.C. Heath and Company, 1948.

Watts (p. 26) recognizes the necessity of verbal mediation if the child is to order his experience because of the language apparatus for expressing differences in genera, species, number, tense, etc. Watts affirms, "This ordering and systematizing can best be effected through free and full discussion of all that has been seen, heard, suffered and done. Only in this way will ideas become interwoven into patterns of greater power and complexity."

The need for classification is imbedded in many routine classroom activities as well as through both spontaneous and planned curriculum experiences. The teacher can use, as a starting point, the following activities.

CLASSIFICATION — Classroom Activities

1. Storage and use of provisions.

   Consumable materials need to be available to all children, so class time has to include sessions on where and how to store, maintain and use the materials. Early experiences initiated by the teacher will trigger a sense of responsibility on the children's part which requires them to sort, arrange and return materials with some order and need to classify.

   "Paul and Betty are sorting the writing materials. Ask them if you need to find a writing tool or paper."

   "Linda is putting together all the pictures we made of the zoo. She needs help in finding all of them."

   "We must look for everything that belongs in the playhouse. If you have anything you think belongs there put it where you think it should be."

2. Permanent text, trade or supplementary materials.

   The children should be involved in sorting and shelving permanent reference and reading materials. In addition to literary classification there is need for estimation of space, number and size.

   "Look at the titles of the books and see how many different labels we will need to make."

   "Arrange these books by size so we will know how tall the shelves must be."

   "Mary has found all the books which have stories about apples."

3. Collections.

   Grouping of objects which are known as hobby collections or items with common attributes can be initiated by teacher, students, or jointly because of mutual need.

   "Find as many objects in the room as you can that are containers. We will put them all in the big red box by the door."

   "John brought his seashells to school. He wants to see how many kinds he has."

   "Donna has been wondering how we use keys in our building. Look for as many keys as you can find."

4. Use of puzzles, games and construction materials.

   Two and three dimensional puzzles for individual and small group work encourage language of comparison and contrast. (The rabbit is harder than the elephant to put together; this puzzle has a key piece that holds it together.) Games requiring turns, counting dice, or taking steps and making decisions all provide language demands to sort and choose. Interlocking, unit and/or hollow blocks can be used to set problems of matching, balance, and spacing — all forms of classifying. Verbal games such as 20 Questions or Password sharpen and extend the concept of classifying. Search for words.

   "You'll need a longer, flatter block under the tower so it won't fall down."

   "See if Carmen has enough curved blocks to make a circle around our tree."

   "There are six ways to get to the Treasure Chest."

5. Community experiences.

   Taking a walk with a specific focus such as one to find a color, kinds of doors, numbers or sizes uses sorting processes. Experience with ditto machines and typewriters in school followed by a trip to tax offices, public service companies and government agencies broadens the classification of office machines.

"What other kinds of machines make more than one copy?"

"How many different trees are growing in this block?"

"What are all the ways to tell drivers what to do at this intersection?"

6. Use of figurative language.

   Concepts of such classifications as keys, hinges, etc. can be enlarged by using more abstract language.

   "She's found the key to this puzzle."

   "Our trip hinges on what kind of weather we have on Monday."

   "Charles pinpointed the problem with the projector."

7. A search for the varieties of ways to spell a given sound.

   e.g. *k* — *c*at, *k*ill, o*cc*ur, ba*ck*, *ch*orus.

8. In class decisions of selecting the person best suited for a particular project, people are being classified.

   "Let's see, we need someone who is very musical to help us to plan the play."

   "I'm not fast enough to play that game with all you speedy second graders."

I believe that this particular kind of figurative extension of classification contributes to aesthetic development and initiates a process of abstraction.

I must help students, therefore, to establish criteria for personnel choices for classroom functions.

CLASSIFICATION — Situation: A Grocery Store Trip

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	It goes here.	[1]Nouns to label item [2]Noun to label category
Teacher:	The [1]*corn flakes* could be grouped with the [1]*oatmeal* because they are both kinds of [2]*cereal.*	
Child:	Look it — carrot.	The pre-article
Teacher:	There are many types of vegetables here and you have just identified *one* of them.	
Child:	There's a vegetable too?	[1]Negation [2]Pre-article
Teacher:	A peach is [1]*not* a vegetable. It's a [2]*type of* fruit.	
Child:	It gots hairs.	[1]verb of "have" class [2]Idiomatic 2-word verb
Teacher:	That carrot [1]*has* roots that do [2]*look like* hairs.	
Teacher:	[1]*Why* do you think the carrot has these [2]*hairy* roots?	[1]Question with interrogative eliciting information about intrinsic nature and function of the object or its class. [2]Noun converted to adjective with "y" suffix.
Child:	This cereal?	[1]Proper noun plus linking verb plus pre-article plus class label. [2]Adverb clause of reason.
Teacher:	Yes, the [1]*Coco Puffs are a type of cereal* [2]*because they are made from grain.*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	They fell.	[1]Adverbial intensifier [2]Adverbs (simple, phrase and clause) describing characteristics: a. of manner (1 word) b. of position (phrase) c. of frequency (1 word) d. of time (clause)
Teacher:	The cans fell [1]*so* [2a]*noisily* that I was frightened.	
Child:	How much does it cost?	
Teacher:	The prices are stamped [2b]*on top of the cans.*	
Child:	Hey, it's soft!	
Teacher:	Lettuce [2c]*always* seems to wilt at room temperature.	
Child:	I saw green bananas at Safeway.	
Teacher:	Most fruit that we buy in a grocery store is picked [2d]*before it is ripe.* Do you have any idea why this is done?	
Child:	Where does this go?	Verbs of classification like "classify," "belong"
Teacher:	Supermarket managers usually *classify* butter with the dairy products, but you can decide where it *belongs* in your store.	
Teacher:	I'll bet [1a]*that* tomato [1b]with the [1c]*green* tinge is not ripe yet.	[1]Adjectives: a. demonstrative b. phrase c. descriptive d. noun [2]Labels a. specific item of class b. class label [3]Phrase defining label [4]Prefix "re" to change meaning [5]Suffix "able" to change noun to adjective
Child:	Is this pig or cow?	
Teacher:	Well, the [2a]*sausage* is labeled [2b]*pork* and the word pork tells us that this sausage is made [3]*from the meat of a pig.*	
Child:	Is this the kind you get money for?	
Teacher:	It's a [1d]*tin* can; you can tell by the weight and strength. Compare it to this [4]*recycleable* [5]aluminum can.	
Teacher:	What type of fruit do you think would be best for making juice?	Questions to get a child to make an appropriate selection of one item of a class.

COMPREHENDING SPACE

The Importance of Space

What can be more important to a child than his sense of self, a sense of being separate yet, paradoxically, a part of the world? Such an intuitive sense of *I* and *not I* is a rudimentary awareness of spatial relationships. It is an awareness that can grow into a comprehension that embraces the universe. To comprehend space forms, on one hand, is the basis of an individual's sense of self which is so important to emotional well-being; and it lays the base, on the other hand, for abstract logical reasoning in the branch of mathematics.

Sigel (p. 266) presents Piaget's three categories of space:

1. Topological, referring to such things as order, enclosure, and continuity. This is mastered early in life and stabilized normally by age 7.

2. Projective, referring to perceptually invariant features of objects even when the point from which the object is viewed changes (object constancy). This can be handled well about 9 to 10 years.

3. Euclidian space concepts, the most advanced category.

It is obvious that space is not just an emptiness to be filled, for it concerns the relatedness of all that is in the universe. Spatial awareness is a matter, too, of seeing relationships from many different viewpoints such as from a standing or a sitting position, from an airplane, through a telescope or through the microscope.

Sigel, Irving E. "The Attainment of Concepts," *Review of Child Development Research*. Philadelphia: Wm. F. Fell Co., 1964.

Spatial awareness is commonly interwoven with a time sense. This is especially evident in our patterns of describing one in terms of the other. For example:

"It was a *long* time ago," re time.

"That's the *fastest* road there," re space.

Guiding the child from the simplest topological concept of "nearby-ness" into the complexities of mathematics, as well as into music, art, athletics, dance, poetry, etc., prompts the classroom teacher into activities such as the following.

SPACE — Classroom Activities

1. Creative movement problems that develop a personal feeling of space.

   "Use your body to make a curved shape in space."

   "Imagine that you are at the bottom of a space and move the way this position makes you feel."

   "Make a movement that takes up a large amount of space. Now make a small movement."

2. Mapping the classroom, school, neighborhood, or area of interest.

   "As you walk east on our neighborhood map, what is the largest building to the south?"

   "How much smaller scale are you going to use to represent the furniture on your room map?"

   "Your block model shows the large mountain sheep pen next to the smaller beaver enclosure. I thought the mountain sheep were farther away."

3. Constant verbal mediation of distance, shape, size, position and direction.

   "We walked toward 'A' Mountain and as we got closer to the base of the mountain, Ochoa School seemed smaller."

   "Show me how you got into and then out of that large box."

   "I see you moved the small chair that was under the table over near the front of the piano."

4. Math activities that deal with spatial measurements.

   "The flag on the flagpole is very high. How many hands high do you think it might be?"

   "That's the widest smile I've ever seen. I'm going to measure it with a ruler."

* "How much fencing will be needed to go around our rectangle garden? How high must the fencing be to keep rabbits out?"

"Can you find a ball or box that has the same perimeters as your waist?"

5. Focusing on function of shape, size, and position.

   "Jerry noticed that Jim's flat ball and our bent hula hoop do not roll right. Only circles roll properly."

   "Your shoe is not my size — because a shoe must be a little larger than the foot for correct fit."

   "As we take our triangle walk, see if you can detect what function the triangle shape has in each object."

   "Why doesn't the umbrella work unless it's over your head?"

* Aren't we getting into basic mathematical needs?

SPACE — Situation: Discussion on Playground

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	I almost can see my new house.	[1] Interrogatives seeking information: a. where b. how far c. how big [2] Comparison verb
Teacher:	[1] *Where* are you living now, Josie?	
Child:	Over there.	
Teacher:	[1b] *How far* south is your new home from the school?	
Child:	Four blocks.	
Teacher:	Then you must live on 30th Street because we are standing on 26th, 26th to 27th, 27th to 28th, 28th to 29th, 29th to 30th, four blocks.[1c] *How big* is your new house [2] *compared* to the old one on 24th Street?	
Child:	Bigger.	
Child:	Now I live south.	Adverbs of place: [1] participial phrase [2] simple [3] prepositional phrase [4] clause
Teacher:	Yes, that's right, [1] *facing south*. Nogales's [2] *far away*. San Xavier is [3] *in the distance* and 30th Street is [4] *where Josie has moved into a new bigger house.*	
Child:	Where do we play?	Synonyms (adjectives)
Teacher:	Ours is the *nearby* kickball field, the one *close* to us. This *large* beach ball seems *too big* to play kickball with.	
Child:	You're too big to play.	[1] Antonyms [2] Adverbial intensifier
Teacher:	What do you mean, I'm [2] [1] *too big*. My husband says I'm [2] [1] *too little!*	

Teacher's and Child's Language	Analysis of Teacher's Language
Child: I kicked it best. Teacher: Well, I guess you win. Your ball is *farther* away than my ball.	Comparison of adverb of distance
Child: Where's Eddie? Teacher: He's *on top of* the swinging rings trying to keep *away from* the girls.	2 or 3-word prepcsition of spatial relationship

A human's personal
space is an important factor in
his emotional well-being. I think we as
teachers can stress + model the value of
respecting the space around each of our
students. We can arrange the classroom environment
to give each student an adequate amount of space
to work in and provide private areas for working,
relaxing and creating.

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UNDERSTANDING TIME

The Importance of Time

The child's awareness of reality becomes more clearly defined as he acquires more comprehension of time, a universally real concept that escapes all our senses. So vital is the human need for ordering of time to the child's growth in reality and responsibility that the teacher needs to be guiding the child consistently from the comparison of *now* and *not now* to increase the elaboration of time concepts that can be measured and recorded.

As the child realizes that today was tomorrow and will become yesterday, he must accept the past as past even as he can be stimulated by the challenge of anticipating alternative actions for the future and their possible outcomes.

Organizing his time motivates the child to learn and to use devices for measuring and recording. It also stimulates both recall and tentative planning for the future.

Social and historic time are usually perceived spatially as cyclic or linear or pinpointed. However, timing, also an aspect of time, is experienced physically and enjoyed aesthetically and kinesthetically.

The following activities suggest ways in which a teacher can help children to "spend time" most effectively and enjoyably.

TIME — Classroom Activities

we need to help students develop patience as they experience waiting periods.

1. Frequent verbalization of time differentiation and flow to develop time awareness.

   "We won't be able to go to the library now, but we can listen to a story after lunch during our regular story hour."

   "Sunday is the day after tomorrow."

   "Self choice time is over now. It's time to put the blocks away."

   "Make a single movement that lasts a long time."

2. Opportunities to measure and document time.

   "We must have a slow oven because our cookies took 15 minutes to bake rather than the 10 minutes as specified by the recipe."

   "It took us almost an hour to hike to the top of 'A' Mountain. How long do you think it will take us to descend?"

   "TWA's schedule for March says its flight to Phoenix departs at 7:15 p.m."

   "A kitten develops for almost two months within the mother before it's born."

   "A knight of the Round Table couldn't have fought with this sword because the date engraved in the blade tells us that it was handmade during the Civil War."

   "You stated in your diary in January that you were afraid of the high loft. Has the passing of five months changed your feelings?"

3. Sequencing events to organize time.

   "I checked the book out of the library; then after reading it to you, it strangely disappeared before I could return it."

   "First we need to select the cookie recipe and then write a shopping list before we can walk to the store and purchase the ingredients."

   "Tell me your feelings before the fight, during your hassle and now that the problem is apparently settled."

4. Anticipating things to come, and providing opportunities to develop control over future events.

   "If we watch the lions any longer we will not have time to see the bears before our bus returns to school."

   "What do you think might happen to the king of the Wild Things?"

   "I'm sorry you stayed on the playground so long that you missed our tasting experience."

Other areas that develop time sense are rhythmic activities (such as dance, poetry and body movement) and ratio & rate in mathematics.

A teacher-pupil made calendar can be an integral part of planning & recording classroom activities.

A kitchen timer is a "natural" for children to use in appropriate games & activities.

TIME — Situation: Planning a Picnic

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	What are you guys doing?	Tense and appropriate adverbs of time: [1] actual present [2] present of custom [3] simple past a) regular verb b) irregular verb [4] future (idiomatic, common form)
Teacher:	We are [1] *suggesting* ideas [1] *now* for our upcoming picnic. We [2] *usually* [2] *need* to plan before a trip can be taken.	
Child:	Santa Rita Park!	
Teacher:	I [3a] *walked* there *last* [3a&b] *week* and *saw* [3b] mud ankle deep on the play field.	
Child:	Maybe it's dry now.	
Teacher:	That's a possibility, Tony, and I am [4] *going to ride* my bike there [4] *tonight* to check out your speculation.	
Child:	I hate that park.	Adverbs of time [1] simple [2] phrases [3] clause
Teacher:	You liked it [1] *before*, Jan. What made you change your opinion of Santa Rita? We are going to listen to everyone's ideas [2] *after the story.* [3] *When you have an alternative suggestion.* Jan, please let us know.	
Child:	I like Santa Rita the best.	Adverb of frequency.
Teacher:	People *often* disagree, Marty.	
Child:	How about Randolph Park?	Adverbs suggesting passage of time or time relationship.
Teacher:	I remember *earlier* in the year when we visited Randolph Park Zoo, someone in our class suggested we return *later* for a picnic.	
Teacher:	Let's settle on a location for our picnic because *after we have selected the place* we *must still decide on several other important issues.*	Clauses suggesting the passage of time or the relationships between different times.

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	When are we gonna make our lunch?	[1]Specific time references in prepositional phrase form. [2]Specific time references in adverbial form.
Teacher:	We could prepare lunch [1]*in the morning* or afternoon [2]*during your self choice time* [1]*after recess at 1:40*. Last year we worked [2]*off and on during a whole day* to prepare a picnic lunch.	
Child:	I went to the best park. It's called Golden Gate.	Questions with interrogatives pertaining to: [1]time or passage of time [2]frequency
Teacher:	[1]*When* were you in San Francisco's Golden Gate Park, John? *	
Child:	Last year at Easter vacation.	
Teacher:	[2]*How many times* have you visited California?	
Child:	Let's go to Yosemite!	The ordinals as: [1]adjective [2]adverb
Teacher:	You are the [1]*second* person to suggest that our picnic be held out of state. *First,* [2]we had better discuss the transportation problems involved before we continue this planning session.	

* An open question would have given John the chance to share his experience.

DEVELOPING THE CONCEPT OF QUANTITY

The Importance of Quantity

The amount or quantity of something rests first, for the young child, on estimates made on a perceptual basis. Consequently, the early awareness of quantity is often illusory and incorrect. It is with the evolving of conservation at about age 8 that the child can appreciate "eightness" for example, regardless of how closely clustered or how widely scattered are eight things.

The conservation is dependent, too, upon the ability to count out eight specific objects. For a child to hold a genuine view of eightness he must experience it himself. To achieve such a view of numbers, a child must have acquired the two pre-number ideas of classification and seriation (Sharp, p. 28). In fact those two logical operations underlie all analytical thinking.

Sigel (p. 236-7) points to considerable research regarding the mental conservation of mass or quantity, weight, and volume, for which there is emerging evidence that conservation concepts appear in an invariant order of mass, weight, and volume. The onset of each level of conservation is closely correlated with mental age. This suggests that the teacher needs to be aware of the predictability of the sequence and also sensitive to the maturing of the child.

Sigel (p. 246) quotes Piaget and Inhelder who claim that quantity is understood in conservation terms by the age (chronological) of seven or eight; weight by nine or ten; and volume by eleven.

With all this in mind the classroom teacher has a responsibility to organize the classroom and environment to present appropriate challenges at the right age as follows.

Piaget, J. and Inhelder, B., Le Developpment des Quantities Chez ——— Neutchatel, delachouse et Misetle, 1941.

Sharp, Evelyn, *Thinking is Child Play*, New York: E.P. Dutton & Co., Inc., 1969.

Sigel, Irving E., "The Attainment of Concept," *Review of Child Development Research*, Vol. 1, Philadelphia: Wm. Felland Co. 1964.

QUANTITY — Classroom Activities

1. Comparing sizes and weights in categorizational play or in order to make a selection.

   "What spoon would you select for our baby doll to be fed with? Would you use a different size spoon to stir a pot of soup?"

   "Suzi is putting the blocks in order by size. She has placed the *smallest one* on her left, and it looks like she is working towards the *largest* block on her right."

   "How much heavier is the red and white striped bag of candy? Would you pick a heavy bag or a light one?"

2. Counting for a purpose.

   "Jane, please count out five new sharp pencils for your committee members."

   "Maria wants to know how many more donuts she needs to fry so that each person has one."

3. Identifying the ordinal positions of first, second, third, last, etc., during games and taking turns.

   "I guess I'm last because I dropped four more jacks than anyone else."

   "The nurse wants you lined up in alphabetical order by your last name. Julie Anton, you are first. Victor Collins is ————————."

   "Will the first five people in line please carry some extra chairs to the program for the mothers to sit on."

4. Use of conversation about numbers, quantity, size, weight, and volume of objects in all possible situations.

   "The two gallon pot is too heavy for me to lift when it is full of water."

   "Why do you think my belt is longer than yours?"

   "The third room past ours is room number seven. Our room is four, next comes five, then six, then seven."

I want to develop games + play to demonstrate that size + weight are not necessarily related, e.g. a big box of feathers is easier to carry than a little box of nails. guessing games re the above are a "natural."

QUANTITY — Situation: Breakfast

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	How many do we get?	Counting
Teacher: *	Let's count the number of people who want breakfast this morning before we bring in the cereal, milk and juice. 1, 2, 3, 4, 5, etc.	
Child:	Give me that.	Antonyms re size
Teacher:	Angela, Patrick is using the *big* pitcher; here is the *little* yellow plastic pitcher for you.	
Child:	See, three the same.	Comparison of adjectives [1] comparative [2] superlative
Teacher:	You do all have ladles, Angela. Your ladle is [1]*larger* than Patrick's and Adam has the [2]*shortest* ladle.	
Child:	Have you got enough?	Questions requiring answers about number, size, weight or volume
Teacher:	*How many* people are eating breakfast?	
Child:	27 want to eat, uh — 5 more?	
Teacher:	Right. That was quick computation, Randy. How *full* is that pitcher? *Is it too heavy to pour?*	
Teacher:	*A few of* you boys wipe up the spilled juice and then *some of the* girls will finish cleaning up the table.	Determiners and/or predictors implying the number of articles
Teacher:	Please just take the [1]*three* trays back to the kitchen, Jesus, and on your [2]*second* trip you can carry the pitchers.	[1] Cardinals as adjectives [2] Ordinals as adjectives

* Don't forget the opportunity to count by 2's, 5's + 10's.

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	I want to do it.	Adverbs implying order of occurrence
Teacher:	Jesus asked *first*.	
Teacher:	Are there two containers of Corn Flakes left? Was Tom the first person to ask for seconds?	Questions regarding quantity, size or position requiring yes or no answers

DEVELOPING A SENSITIVITY TO CHANGE

The Importance of Change

Change can affect matter, space, territory, time, physical development and deterioration, social organization and human attitudes. To explore these areas fully is to pursue scientific causality, to examine traditional subject matter areas, to develop a philosophy, to comprehend government, and to enter into an understanding of the workings of a human mind.

The infant is aware of transience very, very early in life even as he acquires the concept of object-constancy. With an awareness of orderliness of some change, the concept of causality is born. With the realization that he can affect change, the child can become both more adapted to his environment and can adapt his environment to his purposes.

For our purposes it is proposed that the classroom teacher consistently help the child in three ways:

1. to identify change
2. to adapt to change
3. to initiate, halt, or reverse change.

Within the limitations of a school routine and a building structure the teacher could provide the following opportunities for the child to appreciate the adaptation perhaps required by change.

CHANGE — Classroom Activities

1. Repeating trips in order to notice changes.

   "The trees were covered with leaves the last time we were in the park and now they look so bare."

   "Have you noticed the difference in the Bermuda grass?"

   "The park attendants must have planted the greener type of ground cover after our last visit to Santa Rita Park."

2. Observing and caring for living things in and out of the classroom.

   "John, you had better water the tomato plants before they wilt any more, or we will be eating an all-lettuce salad."

   "Our kittens have become so well coordinated during the last month, they move much more gracefully."

   "Jose, did you notice if any changes took place in the appearance of our goldfish before they died?"

3. Tasting, touching, looking at and smelling ingredients, during and after cooking.

   "The ground round was beet red and very pliable before we dropped it into the boiling water, but after it cooked for twenty minutes, it looked and felt different."

   "The egg whites fill the entire bowl now that you have beaten them with the electric mixer."

   "What happened to the popcorn kernels during the cooking process?"

4. Recording and discussing physical and emotional change in people.

   "John, our graph says you have gained eight pounds during third grade and you have grown an inch and 1/2 since Christmas vacation."

   "I must constantly trim my fingernails to keep them out of the typewriter keys."

   "How do you feel now that the fight is over?"

5. Planning with children to initiate, encourage, retard or reverse change in their environment.

   "You say you want to hold class outdoors for the rest of the week; well then, what steps must we take to make this move possible?"

   "How can we display your new art projects if you don't want to take down the Halloween bulletin board yet?"

   "I moved the games and writing materials around to give us more working space, but Martha says the room was more functional before, so I will return the items to their previous places."

6. Exploring the ways in which social, historical, mechanical and environmental changes affect human life.

   "Your diorama depicting the age of the dinosaur makes me wonder how our life might be different today if the dinosaurs were not extinct."

   "How do you think people found out about past wars if they didn't have television? Do you feel there will be a need to develop new means of reporting future battles?"

   "Andre, you are right; the car was important to your family's trip to Disneyland, but not everyone is happy with the changes brought on by the automobile."

we can help children accept reality by discussing things in their lives that they may be unable to change, such as death + parents' actions.

CHANGE — Situation: Looking at Baby Pictures

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	That's not you!	Verbs: present and past [1] linking verb "to be" [2] the "become" class of verb.
Teacher:	Yes, the picture *is*[1] of me when I was a baby. Thirty years ago I *was*[1] smaller and different. Many changes took place before I *became*[2] an adult.	
Child:	You still got green eyes.	Similarities and dissimilarities as . . . as not . . . as
Teacher:	My eyes are *as green* now *as* they were when I was five months old, but my hair is *not* nearly *as red*.	
Child:	It was me in second grade.	Differences not . . . the same . . . as
Teacher:	Your hairdo is different now. You *don't* have *the same* curly bangs *as* you did last year.	
Teacher:	You were smiling *then*[1] *and*[2] you are smiling *now*.[1] It looks like you are always happy, *but*[2] I'll bet you have felt many different emotions during the last year.	[1] Contrasting *then* and *now*. [2] Compound sentences using "and" and "but."
Child:	Why is she crying?	[1] Conjunction of time introducing adverbial clause. [2] Prepositions referring to time.
Teacher:	*Just before*[1] that picture was taken I pinched my sister. She got her revenge *after*[2] the sitting was over by sinking her teeth into my arm.	
Child:	He couldn't scare a flea.	Comparison of adjectives and adverbs.
Teacher:	The puppy is bigger now and he barks *more* convincingly.	
Teacher:	*Before* snapping the picture, the photographer must have told you a joke.	Prepositions referring to time.

I should also model adverbs suggesting before + after and process verbs like change, cook, alter, etc.

DISCOVERING CAUSE AND EFFECT

The Importance of Causality Awareness

Bruner (p. 46) suggests early precurriculum training in science and mathematics toward "building up in the child the kind of intuitive and more inductive understanding that could be embodied later in formal courses giving the child a better and firmer comprehension of concepts." Unless the concepts are comprehended early, the child may later refer to abstract concepts without any real understanding.

Causality is a concept very basic to such a precurriculum training because it is absolutely essential at the curriculum level. Its development is commonly frustrated by adults who often lead children into a world of fantasy with much anthropomorphic misinterpretation of environment (e.g., fairy tales). However, a teacher's explanation of the nature of order in the universe may often be in direct opposition to some home-taught anthropomorphic and often religious interpretation. If the cause-effect relations of a situation are discovered by the child himself the child need not, and probably will not, resist the data. An adult could aid this discovery of causality by structuring situations so that the child would wish to ask "Why?" or "How?"

Bruner (p. 47) indicates a possibility of the first two years of school as the precurriculum years for "training the child in the basic logical operations that underlie instruction in mathematics and science. There is evidence to indicate that such rigorous and relevant early training has the effect of making later learning easier . . . one not only learns specifics but in so doing learns how to learn."

A satisfying answer to a "why" question is, in most cases, beyond the comprehension of many adults, to say nothing of the child. The "why" question easily diverts the child's mind from actual descriptive facts to anthropomorphism. The "how" question, on the other hand, elicits a more concrete and a scientific attitude and leads the child more easily to an awareness of how he can use new knowledge to control his environment or to aid him to accommodate to his environment.

Piaget carefully follows the child's maturing levels of reality comprehension as he speaks (p. 368) of the child " . . . overcoming his egocentrism in order to extend the rational construction prepared during the first two years of life and to expand it into a system of logical relationships . . . "

In Piaget's introduction to *Construction of Reality in the Child* (p. xiii) he speaks of this as "a transition from chaos to cosmos."

The following classroom activities should prompt the child to move from a concept of selfcentered universe to objective and logical causality.

Bruner, Jerome S. *The Process of Education.* Cambridge, Mass.: Harvard University Press, 1961.

Piaget, Jean. *The Construction of Reality in the Child.* New York: Basic Books, Inc., 1954.

CAUSE AND EFFECT — Classroom Activities

1. Help children develop responsibility for their own actions by acquainting them with possible consequences.

   "If you hit John he may give you your truck back, and then on the other hand, maybe he will beat you up."

   "What might happen if you don't go home after school today?"

   "Turning in a false fire alarm sets off a chain of events that you should be aware of before you break that glass."

2. Provide cooking experiences that focus on cause and effect.

   "What will happen if you add an extra cup of milk to the pudding mix?"

   "Could the oven temperature be the cause of your burned pie crust?"

   "I wonder how the cake will taste since you don't seem to be measuring any of the ingredients?"

3. Plan art and science activities that stimulate children to look for reasons.

   "Pepe noticed that our plants in the closet are not doing nearly as well as the ones out in the open. Do you have some ideas on his observation?"

   "How does the plaster of paris turn from a solid to a liquid and then back into a solid?"

   "I wonder why the boiling water disappeared?"

4. Repeat trips to note and discuss why changes have taken place in the environment.

   "Why do you think Randolph Park looks prettier this spring than it did during our last trip here in December?"

   "Downtown does seem very dirty this visit. I wonder if people are getting sloppier, or if strong winds are blowing garbage out of those open cans."

   "I can't believe my eyes. There used to be a house on this corner! When did it become an empty lot? How did it happen?"

5. Capitalize on unexpected phenomena in order to see the chain of causal events.

   "We are faced with floods now because snowfall was so heavy this last winter. When the spring thaw combines with these unseasonal rainstorms our riverbanks can't contain the added water."

   "I didn't read about the fire, Julie. Fill me in on what happened."

CAUSE AND EFFECT — Situation: Watching it Snow

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	It's snowing! Can we go out?	Adverbial clauses
Teacher:	Wow, it is snowing! Let's put on our coats *before we go outside.*	
Child:	I don't want a coat. Let's just go.	Questions requiring information answers — interrogatives
Teacher:	*Why* do you think I feel coats are important?	
Child:	I won't get a cold. It's not cold.	The "become" class verb
Teacher:	You knew just what I was thinking of — the temperature and its possible effect on your health. I'll bet the air has *turned* very cold.	
Child:	A hard one and a soft one.	The verb of thinking plus noun or adverb clause
Teacher:	I *wonder why that snowflake is harder.*	
Child:	This one's like a rock. It's ice.	The modal "can " "difference"
Teacher:	I *can* see a *difference* too, Mari.	
Teacher:	You're right. [1]*First*, I thought you were showing me two snowflakes, but [2] *on second* observation, I think you had a snowflake and a piece of hail.	[1]Adverb reflecting sequence [2]Adverbial phrase reflecting sequence

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	How does it snow? It's God, huh? He does it, huh?	Causal explanations [1] thinking verb [2] verb of process [3] Prepositional phrase of duration
Teacher:	Some people *feel* [1] God is responsible for the type of weather we have, Albert. Scientists *believe* [1] that before snow *may form* [2] the clouds *are cooled* [2] to a very low temperature. After the moisture in the sky *turns* [2] to ice, it begins to *grow* [2] around tiny specks of dust that always float in the air. [3] *During this snow-making process* the ice *grows* [2] until it makes the little six-sided flakes that fall down on us. The clouds are important, Alfonso.	
Child:	The little hails are snow, teacher? Do clouds make them too?	[1] Gerunds reflecting process [2] Process verbs [3] Participles reflecting process
Teacher:	When rain freezes and is kept from [1] *falling* by strong winds inside a cloud, the pieces of ice [2] *grow* larger and larger as they are tossed up and down. This [3] *frozen* rain from thunderclouds is called hail.	

Such vocabulary as "reason," "because," "as a result," "for the purpose of," etc. would enter into many other discussions of causality.

FOSTERING TENTATIVE THINKING

The Importance of Tentative Thinking

Tentativeness in thinking is a process of anticipating both condition and consequence before action takes place. A tentative thinker holds several ideas in his mind simultaneously related by such structures as:

as if . . .
if . . . then . . .
unless . . .

A child who can think tentatively develops skills of adaptiveness because:

1. He is open to if not expectant of change.
2. He is less likely to feel insecure by sudden environmental change.
3. He is more likely to initiate change because he has foreseen possible consequences and may have already adjusted emotionally to a range of possibilities.

This level of thinking seems to be basic to so many of the learning to learn skills. It can be considered a prerequisite for developing the intellectual flexibility so essential to creativity. It would be a built-in aspect of weighing alternatives and choosing. Similarly, an awareness of causality and an awareness of change would seem to be prerequisite to thinking tentatively at an effective level.

Some classroom activities for cultivating more skills in tentative thinking follow.

TENTATIVE THINKING — Classroom Activities

1. Model predicting possible outcomes of science experiments.

   "What might happen if we place some of the bean plants in the dark closet?"

   "What do you predict could take place if Ruben puts this mouse into our snake cage?"

   "If I removed the caps from the bottles would they still float?"

2. Use guessing games and a touch box to narrow possibilities through the use of clues.

   "If this person were an airplane he would be a jet. If he were an animal he might be a greyhound dog. If he were a type of food, he could be popcorn. Who is he?"

   "Turtle would not be my guess, Juan, because Judy said the object in the touch box is round and flat and fuzzy. Unless the turtle was wearing an angora sweater his texture would not agree with Judy's clues."

   "From the weight and shape of the touch box surprise I would guess a metal pipe or perhaps some other type of plumbing equipment."

3. Involve children in planning changes in schedules or environments.

   "If we have self selection time right after breakfast as Adam suggests how might this change in our schedule affect our committe work and recess time?"

   "Let's think of all the possible ways we could arrange our room so that we will have space for a greenhouse."

   "Unless you can come up with some alternatives to this kickball schedule it looks as if we will only be able to use the field twice a week."

4. Encourage experimentation and substitution during some cooking experiences.

   "From the looks of this beautiful golden pie crust it appears you might have experimented with the baking time or oven temperature. It's quite a change from the burned edge on our last pie."

   "Well, if you dislike nuts, try eliminating them in the next batch of cookies and see if their absence causes any problems. If it does, perhaps you can think of a substitute ingredient."

   "I couldn't find any raisins at the E.Z. Save for you to decorate the gingerbread boys with. What might be some solutions to our problem?"

TENTATIVE THINKING — Situation: Contemplating Weather

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Remember when it snowed a long time ago?	Past tense Adverb
Teacher:	Yes, Thelma, that *was almost a year ago.*	
Child:	It's gonna do it today.	Modals suggesting possibility (subjunctive)
Teacher:	What makes you think it *might* snow this winter?	
Child:	'Cause it looks like it.	Modal suggesting possibility (subjunctive)
Teacher:	Are the grey sky and cold air giving you clues as to *what could happen?*	
Child:	Yea. If it's real cold it snows, huh?	[1]Noun specifying possibility [2]If . . . then [3]Verb of expectation
Teacher:	There is a *possibility*[1] of snow, Adam, when the air is cold. *If*[2] it doesn't snow today *then*[2] what other types of weather might we *expect?*[3]	
Child:	It could rain or maybe that little ice could fall.	[1]Adverb of possibility [2]Conjunctive of possibility [3]Idiomatic verb suggesting close possibility
Teacher:	[1]*Perhaps* we will see some rain or hail, Rene. The sky does look [2]*as if* a change of weather is [3]*about to happen.*	
Child:	Can we still go to the field trip if it snows?	Verbs of consideration and decision.
Teacher:	That would be up to our bus driver *to decide.* What conditions will he have *to consider?*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Maybe we could get stuck.	Adjective of possibility
Teacher:	Yes, Joel, that's a *possible* consequence of driving in snow.	
Child:	Sometimes the cars slip and crash. My daddy bumped into a Volkswagen.	[1] Verb of causality [2] Direct object denoting consequences
Teacher:	You're right, Thelma. Layers of snow and ice on the road [1]*could cause* [2]*dangerous driving conditions* and an [2]*accident* like your father experienced.	
Child:	If we don't get to go then we can still have fun. We can make a snowman.	Adverbial clause of uncertainty
Teacher:	That's a cheerful thought, Kathleen. *Unless the weather changes within the next two hours* there is still a strong possibility of our going to Old Tucson.	

CHOOSING ALTERNATIVES

The Importance of Choosing

To weigh alternatives the child must have arrived at a level at which he can internally foresee and consider possibilities and evaluate outcomes of action taken. This means holding more than one idea in the mind at a time. To achieve this a child must also be able to remember and to compare.

This capacity is essential for the child to move from the random trial and error approach to an approach of organizing objects, symbols, or experiences so that he can selectively choose an alternative and know the reason for the choice.

Obviously, finding various ways to approach a problem or a situation enhances flexibility and contributes to creativity. The discovery of the various ways is contingent upon seeing a situation from more than one vantage point, again a corollary of creative and productive thinking.

Choosing implies some delay (however slight) in action because various strategies must be considered and then the outcomes weighed. Also, the various strategies and goals weighed differ in terms of narrow and broader focus. A person who hastens to jump the obviously vulnerable checker will lose the game, and the player who sees the whole board and the more complex play involving a series of jumps will win the game.

Some choices have to do with establishing priorities in values, thus introducing moral, ethical, and aesthetic judgments which must be quite personal.

Group choosing requires students to share their differing value priorities and to agree on rules for governing their differences. The whole range of political processes becomes very relevant to the choosing of alternatives by a group.

Having decided what to do in a situation, the child, or children, ideally, have either foreseen the outcome or have become aware that the outcome is vague. In any event, they need to feel responsible for the consequences of their decisions.

Increased child autonomy and reduced personal dependence would seem to be corollaries of learning how to weigh alternatives and to develop the skill of choosing. This process is also basic to developing a sense of discipline and responsibility. Having weighed alternatives and having made choices or decisions the chooser has some responsibility for the outcome or consequences. Only in situations involving life and safety should the child be protected from the consequences of his own decision.

Bruner (p. 90) sees this autonomous thinking beginning with internalization which frees the learning from immediate stimulus control. In other words, language and symbols are very important to this particular process.

The following are ideas to help the teacher to encourage the child to weigh alternatives and to choose autonomously.

Bruner, Jerome S. *On Knowing: Essays for the Left Hand*, Cambridge, Mass: Belknap Press of Harvard University Press, 1962.

CHOOSING — Classroom Activities

1. Involve children in the planning of classroom activities and field trips.

   "What could we do to make our wait in the cafeteria line less boring?"

   "We can visit either the University museum or the State museum. What would you like to know about both places to help you make a choice?"

   "What else could we use in the measurement center?"

2. Offer children choices rather than assignments.

   "What can you do with those art materials?"

   "How might you thank Mr. Ortiz for the lumber?"

   "Which book would you rather read?"

3. Make children aware of any obligatory consequences of a particular choice of activities or materials.

   "If we play musical chairs then those of you who want to folk dance will either have to borrow another record player or come up with an idea of your own to provide music."

   "Keep in mind the time element involved with the materials you choose to make your puppets. A paper bag puppet might be finished in 10 minutes whereas a paper maché puppet would take much longer to complete."

   "Unless you measure the jute carefully you are apt to end up with uneven pieces that could spoil your macrame piece."

Children can draft alternate rules for a game and then vote on the rules to be adopted.

CHOOSING — Situation: Planning Session for a Cooking Experience

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	We want to make something out of this stuff.	Use of the conjunction "or."
Teacher:	Well, you could look through some recipe books *or* invent a new combination of ingredients.	
Child:	We don't have enough things to make any of these cakes.	Question using interrogative forms to elicit a choice.
Teacher:	*What else* do you need?	
Child:	Different things. Cakes have too much stuff in them.	[1] Adjective comparison. [2] Adverbial clause of purpose (because) or reason.
Teacher:	In my opinion, cookies would be easie*r* [1] for you to make [2] *because they don't require so many ingredients.*	
Child:	I want to make a big wedding cake.	Antonyms
Teacher:	It's up to you, Angela; but a wedding cake is a *complicated* procedure and cookies are *simpler.*	
Child:	I'm hungry. Let's make something fast.	[1] Adverb comparison [2] "er" than
Teacher:	Do you know which bakes fast*er*,[1] cookies or cakes?	
Child:	Cookies. They are smaller.	
Teacher:	Little cookies do bake *faster than* [2] big cakes.	
Child:	How many want cake? How many want cookies? We are going to make a wedding cake.	[1] Conjunction of contingency. [2] Main clause stating consequences.
Teacher:	*Unless*[1] you come up with the missing ingredients or devise a recipe that eliminates eggs and whatever else it is you are lacking, [2] *you are going to be in trouble.*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Should we get the other things we need?	Verbs of preference
Teacher:	Which would you *rather* do? Do you *prefer* experimenting or following a recipe?	
Child:	I prefer a recipe.	The verb "choose"
Teacher:	Well, then your next step is to *choose* a recipe and see what ingredients you will need to gather.	
Child:	We picked one. We need eggs and baking powder and vanilla.	Modal of possibility (subjunctive)
Teacher:	Where *could* you get those three ingredients?	
Child:	You can buy them for us at the E-Z Save.	
Teacher:	*Could* anything happen to spoil your plans?	

DEVELOPING THE ABILITY TO BE RELEVANT

The Importance of Relevancy

A child who is a relevant thinker is a child who can find a focus or who can pursue a goal. He does this because he can apply the skills of identifying, discriminating, classifying, and choosing. Thus the child brings order, his own order, into his world. Regardless of how imaginative and creative a child may be, he can distinguish fantasy from reality and he can recognize the "givens" of a situation.

The child's effort to focus is strengthened by the adult who reinforces the child by responding relevantly to the child's interests. Room arrangement, even, can be conducive to focusing a child's thinking.

Various children in a classroom will focus differently in their thinking if the classroom program encourages autonomous development and is not arbitrarily dictated. Conflicts can ensue regarding activities, room arrangement, and use of time. There will be need for dialogue to decide with children how they can assist one another in pursuing their various goals, how to take turns, and how to undertake cooperative learning ventures. In this situation the moderating adult will play an important role of helping the child to identify specific goals, to recognize the "givens," and to establish priorities for activities.

What about the child who is insistently irrelevant? There are such children in classrooms who resist cooperative class efforts to agree on tasks. This continued inappropriate behavior is probably a signal that the child needs help in modifying some disturbing relationships in his life. In the meantime expectation of relevancy for him in the classroom will be more stabilizing than not.

Planning and problem solving require relevant thinking to such a degree that they are truly indivisible. We separate them academically just to be sure that all components are recognized.

Some classroom activities conducive to developing this capacity to be relevant are enumerated as follows.

RELEVANCY — Classroom Activities

1. Use small group discussions and sharing times to allow each child to contribute relevant information.

   "That was such an interesting story about your dog Sostenes. Does anyone else have a talented pet they would like to tell us about?"

   "Ruben, you said that you want to build a chopper and Carlos stated that he wants a 10 speed bike for his birthday, so I guess I can add my own wish for an X.K.E. Jaguar car, since our conversation has turned to types of transportation."

   "Does anyone have an idea about what types of materials we might use to bind our own books?"

2. Develop appropriate use of the environment and equipment through the use of modeling and group planning.

   "I'm taking the spray paint out to the patio to use because the fumes can be dangerous in a closed area such as our room. I'm also taking newspaper with me to place under my model plane so that the grass will be protected."

   "Elsa suggested that we move the art center closer to the sink so that water will be easily available for our projects and clean up after."

   "Will the people in the reading center be able to concentrate if both the record player and the electric saw are in use?"

3. Capitalize on holidays and special events that lend themselves to a wide range of relevant activities.

   "What would be a good illustration for your Mother's Day card, Joel?"

   "What types of decorating could we use to create a spooky feeling for our Halloween party?"

   "People celebrate Christmas in many different ways. How do you celebrate at your house, Liza?"

4. Express and accept a wide range of emotions while helping children identify and display emotion appropriate to given situations.

   "Judy is angry with you because you laughed when she fell. What might you have done to make her feel better?"

   "Go ahead and cry, Adam. It's a natural expression of pain and unhappiness.

   "I'm frowning because that repair man was so rude that he made me mad!"

RELEVANCY — Situation: Problem of Assembling a Wagon

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	Guess what [1] *type of* transportation is in this box.	[1] "Type of" identifies class [2] Conjunction of exception [3] "Clues that tell" [4] Modal with negation
Child:	A pony?	
Teacher:	A pony is a type of transportation, Jose, [2] *but* the size of this box is one of the *clues that tells* [3] us that it *couldn't* [4] contain a pony.	
Child:	It's a wagon!	Open ended question Modal of possibility
Teacher:	What makes you think there *might* be a wagon in the cardboard box, Jesus?	
Child:	It's big like a wagon and you said we maybe could get one.	Reinforcement of specific problem-solving skills Identification of the "givens" justifying clues Intensifier or adverb "exactly"
Teacher:	Boy, you are really putting the clues together, Jesus. The size of the box and our conversation about a wagon yesterday helped you guess the contents *exactly* right.	
Child:	Can we open it?	
Teacher:	Yes.	
Child:	Hey, it's broken. The wheels are off and stuff.	[1] Open-ended question for information about cause [2] Antonyms due to use of "un" prefix [3] Adverbial clause of contingency
Teacher:	[1] *How do you think that happened?*	
Child:	It's not broken. You have to put it together. My dad put my scooter together.	
Teacher:	Oh, do you mean that the wagon came [2] *unassembled*, Ramiro, and we will have to [2] *assemble* it [3] *before we use it?*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	Yea, we have to, what did you say?	A question clue rather than a direct statement of fact.
Teacher:	*Assemble it?*	
Child:	Yea, we have to assemble it.	
Child:	How come it's broken?	Reinterpreting child's derogatory view of another and providing rationale for behavior and explanation for irrelevancy.
Child:	Gad, it's not broken, stupid.	
Teacher:	Julie's not at all stupid, Ramiro. She just must have been thinking of something else and missed what's been going on here. Why don't you catch her up on what we have been talking about?	
Child:	The wagon is unassembled and we have to put it together.	[1]Clause of purpose—conjunction "because" [2]Noun clause identifying relevant subject matter [3]Verb of definition
Child:	What is "unasable?"	
Child:	You are too stupid!	
Teacher:	Ramiro, remember that I had to explain the word assemble to you, and I surely don't feel you are stupid. Julie, Ramiro has lost his patience with you [1]*because the class has just discussed* [2]*what you are asking about*. Unassembled [3]*means* the wagon is in many parts that have to be put together or assembled before it's usable.	
Child:	We can make it in the woodwork center in self selection time.	Label appropriate behavior, e.g., "planning." Specify problems to be solved.
Child:	Uh, uh, Jose. We are using the woodworking center today to finish shoeshine boxes.	
Teacher:	What made you choose the woodworking center, Jose?	
Child:	'Cause the tools are there. We need tools to assemble the wagon.	
Teacher:	That's [1]*good planning*, Jose. Now how are you and Mario going to solve your [2]*space and tool problems?*	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	You can use the center tomorrow, Mario.	"But" — a conjunctive introducing another consideration
Child:	No, we get it today. You go work outside or something.	
Child:	Yes, can we?	
Teacher:	Sure, that's fine with me *but* didn't you mention that you needed some tools?	
Child:	Oh, yea, and they got them.	Modal of possibility, e.g., "might"
Teacher:	What types of tools *might* you need to assemble the wagon?	
Child:	A hammer? And the thing that holds tight. I don't know.	[1]A question clue re a label rather than a direct statement of fact. [2]Precision indicated as being relevant.
Teacher:	[1]*Do you mean pliers?*	
Child:	Yea.	
Teacher:	How could you find out[2]*exactly* what tools to use?	
Child:	I could ask my father.	
Child:	Mr. Dominguez knows everything.	
Child:	It tells you inside on a paper.	[1]Reinforcement of *all* efforts.
Teacher:	[1]*All three of you have good ideas.* I'm sure your father or Mr. Dominguez would be able to help us if they were at school today. What is this paper you are talking about, Carlos?	
Child:	See, it shows how to put it together. I think is says what tools to use.	Reinforcement of child's tentative but accurate guess.
Teacher:	Yes, Carlos, you sure are a big help. The instruction sheet does tell what tools to use.	
Child:	A saw?	Labelling and defining Indication of a "tool" category
Teacher:	A saw is a tool, Julie, but as we were saying, the instruction sheet says you will need a screwdriver in addition to the hammer and pliers that you boys already mentioned.	

Teacher's and Child's Language		Analysis of Teacher's Language
Child:	You can have the pliers and the screwdriver, but we need the hammers.	Teacher ignores quarrelsomeness and stays with the task of solving a problem.
Child:	You don't have to pig all the hammers, Mario!	
Teacher:	Tony, you have your hand up. Does that mean you have a solution to this problem?	
Child:	When's it lunch?	Inform students of time "givens"
Teacher:	All of this hard work must have made you hungry, Tony. Lunch is served in 40 minutes. Now to get back to the subject, what are we going to do about the hammer shortage?	"Back to the subject" is a common way to demand refocus.

Other ways are:
"as you were saying"
"speaking of....", etc.

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TEACHING PLANNING

The Importance of Planning

If a child is to become his own best teacher he must be actively involved in developing his own methods of learning, and as Piaget states, the involvement must include authentic work. Piaget says, "When the active school requires that the student's efforts should come from the student himself instead of being imposed, and that his intelligence should undertake authentic work instead of accepting pre-digested knowledge from outside, it is therefore simply asking that the laws of all intelligence should be respected."

If children are to become self ordering decision makers, teachers must not rob them of opportunities for growth. For example, students must be able to participate fully in record keeping, in assigning work and in determining evaluation criteria. These skills are learned gradually and children need opportunities for simple planning and organizing of limited experience before they can make and execute complex plans. Children grow into effective planners when provided with a great deal of experience in setting goals, examining possible procedures and details concerning plans, organizing, implementing and evaluating.

Planning is a multi-stepped skill. A successful planner must know when to start and how to proceed logically while working toward his goal. A teacher can help the child make important learning decisions in the major phases of planning by helping him focus on questions such as these:

1. **Setting goals**
   What do I want? What do I want to do? What do I want to make or create?
2. **Examining possible procedures and details**
   What information will I need? What conditions are unchangeable? What will the consequences and effects of my acts be?
3. **Organizing**
   How do I get materials? How much time do I need? Where will I work?
4. **Implementing**
   Should I make some changes in my plan? Are new resources needed?
5. **Evaluating**
   How well did my plan work?

Some of the ways to increase opportunities for pupil involvement in classroom planning and to develop responsibility for self direction follow.

Piaget, Jean. *Science of Education and the Psychology of the Child.* New York: Orion Press, 1970.

PLANNING — Classroom Activities

1. Help children develop organizing abilities by involving them in the planning of classroom events.

   "I wrote some questions on the board that should guide us in planning the best talent show ever.
   1) Will the talent show have a theme? If so, what will it be?
   2) When will the show be?
   3) What will each of us do in the show?
   4) Whom should we invite to see our show?
   5) In what order will we perform?
   6) Are we going to use costumes and props?
   7) Will there need to be any special arrangements for furniture?
   8) Should we serve refreshments, and if so, what?
   9) Who is going to clean up?
   10) How will we know if our plans are working out well?"

   "If we are going to make green corn tamales for our Christmas party, we must carefully plan our use of time because we are committed to other projects now that need to be completed before Christmas vacation. We will also have to plan with the other class in connection with the use of the school's cooking equipment. I'll bet most of the classes will be preparing treats for their parties that require the use of hot plates and other equipment that we need for making our tamales."

   "There are a lot of things to think about before we set up our new aquarium. What environment is necessary for healthy fish? What type of fish get along well together? What do fish eat? What types of things do we want to add to the aquarium to help decorate it? How much do fish cost? What other questions can you think of that will help us plan a good aquarium?"

   "Let's make a list of the things that need to be done in the order that we will accomplish them."

2. Give children opportunities to sequence by involving them in the planning of real and imaginary trips.

   "Carlos said that he would like all of us to walk to his house to see his new puppies. I made a map of the neighborhood to look at so that we can select a route and perhaps decide on some other places in the area you might like to visit. Can you find the school on the map? O.K., let's start here at the school to plan the route."

   "Let's plan imaginary vacations to places we have always wanted to go. No place is too wild or out of bounds. When I plan trips it helps me to make a day by day list of items to consider and accomplish to make my trip successful. Some of the considerations that pop into mind are transportation, expenses and weather. Help me list other factors that might affect our imaginary vacations."

3. Invite students to participate in the planning of their classroom environment, work schedules and curriculum.

   "If you have an idea for a new arrangement of our centers, please draw your plans so that we can discuss as a total group the pros and cons of different room arrangements. If you're fresh out of ideas, as I am, you might want to make a map of the room out of Lego blocks or Lincoln Logs or maybe even cut paper and then arrange and rearrange the furniture until you hit upon a workable plan that you are happy with."

   "I have heard many good clues from you about subjects you would be interested in studying. Now we need to get together and decide which areas we will study as a class.

what topics should be investigated in small groups and if there will be projects that might be best worked on by just one person. John, you stated that you would like to learn more about the new World Football League. Is there someone else interested in the area of football?"

"Wow, today was a real rat race! How can we reorganize our time schedule for tomorrow so that you will be able to accomplish your assigned committee activities and still have time for self selection time?"

4. Make sure that the children are able to observe the adults in the classroom as planners.

"We have tempora powder and slick finger painting paper. We will have to ask Mr. Joe to give us two quarts of liquid starch from the supply closet so that we can finger paint tomorrow. I must remember to wear my old paint clothes because I always seem to end up covered with paint, even when I wear a smock."

"You have quite a busy evening planned for yourself, Suzi. After school today I will pick up my son at the baby sitter's house and then stop to buy gas before the tank is empty. Then on the way home I'll try to visualize what is in my refrigerator. I need to plan a quick, simple dinner because my husband and I want to attend the free band concert at Randolph Park and it begins at 7:30 sharp."

* "Mrs. Rodriquez and I are going to plan now for a new science center. Please feel free to join us and add your ideas."

5. Introduce and encourage the children to play games of strategy.

"What an interesting idea you have developed. I've never played partners in chess. Tell me, are two heads better than one in planning your strategy?"

"I learned a new game to play on the go board at a friend's house last night. Would anyone like to play it with me? I would be happy to teach the rules to you."

"Games like checkers and chess and go make you think ahead and develop plans to win. I enjoy them more than games of pure chance because I like to have some control over my chances of winning."

If we as teachers model the complete planning process our students will see that many tentative plans are made and changed by adults before a final plan is formulated. The flexibility to change plans as situations + data change is a valuable quality to develop.

* This is a good way to affirm need for everyone to share planning.

PLANNING — Situation:
Planning the Use of Self-Selection Time

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	We *only* have 15 minutes *to plan* for tomorrow's self selection time so we will have to be very organized *to finish* in time. Let's begin.	Presenting time limitations. Giving reason for necessity to be organized. Adverb "only" Infinitives: to *plan;* to *finish*
Child:	Cooking center. I want to make popcorn.	
Child:	No, chocolate chip cookies, but we need more eggs.	
Teacher:	I'll write the words "cooking center" on the board so that we won't forget your suggestion, Lizzy, *and then after* we have listed everyone's ideas we can discuss such factors as options within each center, materials and time.	Intellectual categorization of suggestions. "and then" suggests sequencing of ideas as does adverbial clause introduced by "after."
Child:	Let's have the game center. We can play bingo. I'll be the caller.	
Child:	That's not fair. He's always the caller.	
Teacher:	*Keeping our time limit* in mind I'll add game center to the list and ask for more suggestions.	Reminder of the time "givens" in this planning session.
Child:	I want to make puppets.	
Teacher:	We have two centers listed, Julie. What center or area of our room would you like to use to make puppets?	Reminder of the territorial "givens" for this planning.
Child:	The home center.	
Child:	No, I want the home center to play house.	

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	Can anyone help solve this conflict of space problem?	Defining problem needing solving. Inviting children to resolve problem.
Child:	We could make puppets at the art center and then Josie could have the home center.	
Teacher:	Thank you, Arnold, for solving that problem. You're quite a diplomat. Now, so far we have four centers suggested: the cooking center, game center, art center and home center. Any more ideas? Cathy, you have a gleam in your eye. Do you have an activity in mind?	Reinforcement of child who resolves problem. Encouraging child (Cathy) to share in planning.
Child:	I want to make a play, but just for the girls; no boys allowed.	
Teacher:	You have my curiosity up, Cathy. I can't imagine a play that doesn't require some of our talented male actors. Well, we will plan the details of each activity after we finish this master list of activities. Where would you like to produce this play?	Helping child to see drawbacks to some ideas.
Child:	In the patio.	
Teacher:	Fine. I'll add play in the patio to our list. The patio is a place where you can talk a lot without bothering others. Any more ideas?	Rationalizing such reinforcing words as "fine."
Child:	Little blocks and trucks. We can do it on the rug.	
Teacher:	Thank you, Joel. Let me review your *tentative choices* so far. Making either cookies or popcorn at the cooking center, playing bingo at the game center, making puppets at the art center, role playing in the home center, acting in the patio and building with blocks on the rug. Are there any additions?	Recognition of tentativeness in developing plan. Summary of plan involves many such as "at the . . . . " "in the . . . . "
Child:	Listening center.	

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	Is there a particular activity you had in mind for the listening center, Albert, or would you like to wait *until we consider options for each center?*	Offering alternative approach to the plan. Adverbial clause of contingency introduced by "until"
Child:	Just do whatever you want to do, like play the records and tape stories and you know, all the stuff.	
Teacher:	Alright, Albert, I'll just write listening center [1]*for now*. I would like to add the writing center to your list because I want to experiment with our new printing press. Are there any more suggestions? O.K., let's go back now and look at each item on the list [2]*in terms of materials needed.*	Accepting child's decision re plan. Adding dimensions to planning, e.g., materials needed for suggested activities. [1] Adverbial phrase of tentativeness [2] Adverbial phrase of relevancy: "in terms of . . . . "

LEARNING HOW TO SOLVE PROBLEMS

The Importance of Coping

From infancy until death, man never escapes problem solving, and these problems may crush him or they may challenge him to further growth. Problems range from self-interested concerns about identity and security to social relationships, to abstract theoretical speculations such as mathematics, philosophy and economics, etc.

Regarding the final level of abstractness, there is a wealth of curriculum materials applicable in such areas as reading, language arts, mathematics, social studies, sciences and all technical areas. When we examine these materials closely, we can see that they are rooted in the notion of establishing the basic learning skills which are being discussed individually in each section of this monograph.

Since problem solving or coping is always part of every life, the child's sense of competence is directly related to whether he can handle his problems, the little ones as well as the big ones, from buttoning his coat to accepting death. If he is to challenge city hall as a man he must experience competence as a child.

Our concern for this final section is to state a philosophical position about helping the young child to cope with all the problems or challenges of his world, whether affective or cognitive. This final area is the level of integration of all the other skills, bringing them to bear upon the child's frustrations in learning.

As the child masters the various skills, learning to apply them independently and on his own, he learns to be aware of both his capacity and his limitations; when to persist in a task and when to postpone a task. He learns to apply all the other skills selectively, imaginatively, and creatively. He also learns to recognize situational limitations realistically.

A classroom is rich with activities to cultivate all the learning to learn skills. Essential to this important integrative process of coping is the involvement of an adult committed to helping the child toward coping autonomously. Therefore, there is need for the adult who is accepting and understanding of emotions and frustrations, who is available to raise prodding questions that help to define problems and to identify possible solutions, and who refrains from unrealistic judgment and coercion toward his or her own goal.

Some typical classroom activities would be as follows.

PROBLEM SOLVING — Classroom Activities

1. Model problem solving by discussing and sharing your own personal and educational problems with children.

   "I backed into a car this morning in the Circle K parking lot. The driver of the other car and I called the police and we filled out an accident report and we exchanged names, but there are still a few things I must do to take care of this problem."

   "Here we all had planned to work with clay next week and now find out that there are no more funds available to us. Mrs. Rodriguez, do you have any ideas?"

   "I can't seem to find a successful way to help you learn your spelling words, Judy, but we won't give up. I'll look through my education books for new ideas and you ask some of your friends how they study their words, then maybe the two of us can solve this problem."

2. Provide creative movement experiences that demand individual as well as group problem solving.

   "Find your own space to work so that the walls and furniture and people will not interfere with your work."

   "Here is your problem. You are to make hitting, kicking, biting, scratching, punching, fighting movements. You are to fight with everyone in the room, but you must not touch anyone."

   "This trio is to work together to show the feeling of a motorcycle through movement."

3. Allow adequate time for children to arrive at solutions.

   "Don't be discouraged, John. Not all solutions come quickly or easily."

   "You boys have until lunch period to settle your differences."

   "Do you need more time to work on your problem?"

4. Help children develop empathy for others' problems as well as gain experience in problem solving procedures through discussions, role playing and debates.

   "How do you think the kids feel about being bussed across town to another school?"

   "Judy, you take the part of the Hopi Indian and Mona will be the Navajo sheep rancher."

   "Miguel feels strongly in favor of year 'round school. Is there anyone who would like to represent the 10-month system in a debate?"

5. Introduce history as a means to gain from others' successes and failures.

   "Let's look at some of the first attempts at aviation, Juan, and maybe we will learn why none of your paper airplanes fly."

   "I'm not surprised to see you girls slugging it out. People have tried to solve their differences with their fists or other weapons for thousands of years. But often acts of violence only lead to more violence."

Perhaps the best way to help children develop their own problem solving techniques is to review alternative solutions and possible consequences and stay away from adding your own moral judgments.

PROBLEM SOLVING — Situation: Coping with Name Calling

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	You have a troubled expression on your face, Ernie. Is there some problem I can help you with?	Recognizing symptoms of problems; e.g. "troubled."
Child:	Joey's brother's gonna get me after school.	Dignifying child's emotions. Teacher initiative to help child feel emotionally secure.
Teacher:	No wonder you seem upset. Tell me as much as you can about this problem of yours.	Expression of sympathy. Open-ended enquiry so that child is aware of the total situation.
Child:	Jimmy's gonna beat me up when I go home and he's in the fifth. Two of them are gonna get me. Jimmy and Joey.	
Teacher:	What has made the Anderson brothers so angry with you?	Prodding questions thus compelling child to describe total problem for himself. Realistic vocabulary, e.g. "angry."
Child:	Nothing, I didn't do nothing. And they are gonna beat me up.	
Teacher:	How did you find out this threatening news?	Open-ended enquiry so that child is aware of the total situation. Realistic vocabulary, e.g., "threatening."
Child:	Joey said. They're gonna get me when I'm walking home. They're gonna hide and beat me up. Two against one ain't fair.	
Teacher:	I agree with you, Ernie, and I'm sure that if two people were threatening me with a beating I would be as unhappy and nervous as you are now. Perhaps we can think of solutions to your problem together. First, I need you to fill me in on your conversation with Joey because I can't quite see the total picture and it's hard for me to understand how Joey and Jimmy became involved with you.	Empathy — verb of agreement. Identifying emotional state and justifying it. Suggesting tentative and alternative solution. Adverb of sharing; e.g. "together." Sequencing procedure to solve problem; e.g., "First,"
Child:	I didn't do nothing. We were playing tag and Joey pushed me and then he said his brother was gonna get me.	

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	I would be mad, too, if someone pushed me, particularly if I hadn't done anything to them.	Empathy expressed by adverb "too" and modal "would."
Child:	Yea, the nigger.	Indirect questioning raising concern for cause.
Teacher:	Is that what you called Joey when he pushed you?	Prodding question to identify possible cause of problem.
Child:	Yea, it's not fair to push.	
Teacher:	Ernie, did you know that the word "nigger" is a name that is used to hurt people's feelings?	Checking child's background knowledge, carefully avoiding belittling father.
Child:	Uh, well, he is a nigger. That's what my dad says.	
Teacher:	Joey is a black person, Ernie, but I would guess that the word "nigger" made him feel hurt and angry.	Modeling socially acceptable vocabulary. Discriminating labels without being moralistic.
Child:	Why? He is a nigger.	
Teacher:	Ernie, usually derogatory names such as "nigger," or "gringo," or "greaser" are used to make a person feel he is not as good as others because of his skin color or where his family is from. Do you think Joey might be threatening you because you called him "nigger"?	Informing child of derogatory semantic implications of labels. Inviting child's empathy by suggesting his own vulnerability. Tentative but prodding question.
Child:	Yea, I guess so.	

Teacher's and Child's Language		Analysis of Teacher's Language
Teacher:	Well, now I can understand your problem a lot better and maybe we can think of a solution that will spare you a beating. Do you have any ideas?	A clear definition of the problem is a must before solutions can be arrived at. *
Child:	Can you drive me home?	
Teacher:	That would be one solution, Ernie, to help you after school today, but what about tomorrow and the day after tomorrow and Friday? I would not be able to drive you home every day after school.	Accepting the child's solution as one possibility. Discussing various implications of a tentative solution.
Child:	I could tell him I didn't mean it.	
Teacher:	You have already thought of two possible solutions. Apologizing to Joey might not only get you off the hook, but make Joey feel better, too. You're on the right track, Ernie, so I'll leave you to make your final decision. If you need me, let me know.	Teacher restraint from directing child's choice. When child makes autonomous decision he should be allowed to live with it.

* Children must also realize that some of the unhappy situations in their lives are caused by others problems and the child may have no effect on the solution of these problems; i.e., fathers going to jail; welfare checks being late, etc.

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This is not
THE END

Please feel free to add to this material; expand it and experiment with it and develop it and refine it and make it your own!